INFLUENCES ON EATING BEHAVIOR: A PARTICIPATORY STUDY USING PHOTO-ELICITATION WITH CHILEAN WOMEN OF LOW SOCIOECONOMIC STATUS AND DIFFERENT NUTRITIONAL STATUS

BY

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DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Community Health
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2017

Urbana, Illinois

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ABSTRACT

Introduction. Around the world, many people's diets have changed significantly throughout the past few decades. This change has contributed to increases in the rates of people who are overweight or obese. It seems that women are more affected than men by obesity, particularly women from a low socioeconomic (SES) background. This is the situation in Chile, where obesity prevalence reaches almost 47% of low SES women. This could indicate that their diet is making them more susceptible to the development of obesity. There is a lack of information about women's eating behaviors in Latin America, particularly in Chile. Given that women play such important roles in Chilean society as mothers, wives, caregivers, and managers of the food budget, it is imperative to study what and why they eat the way they do.

Aims: (1) explore the influences on eating behaviors among low-SES women living in Santiago-Chile; and (2) compare the influences on eating behaviors of low-SES women who are normal weight, overweight, and obese.

Methods: An exploratory study, using a grounded theory approach, was applied. Thirty-one women of low SES, aged between 25-50 years old, participated in this study. All of them were married, had children younger than 12 years old, and were living in poor urban Santiago-Chile neighborhoods. Semi-structured interviews with photo-elicitation were conducted with these women. For this, participants received disposable cameras, and they were asked to photograph everything that was important to them as related regarding their food world. Pictures were developed and used to elicit information during interviews. The interviews were transcribed verbally. A thematic analysis was conducted in Spanish by five Chilean nutritionist researchers to answer the first aim - "*the influences on eating behaviors*". To answer the second aim – "*comparing the influences on eating behaviors among normal weight, overweight, and obese*

women" – we used a mixed method approach where participants were divided by these three nutritional statuses, according to their BMI. Using the thematic analysis, we reviewed how themes found among all participants as a whole were represented in each of the three groups, from both quantitative and qualitative approaches. For this, we analyzed the percentage of participants that mentioned a theme and the mean of the number of times that a theme was mentioned during the interviews (quantitative approach). We used Fisher's and Kruskal Wallis tests to conduct the analysis, with a significance level of 0.05. In addition, we conducted a qualitative description of each theme found across all participants, and by group (qualitative approach). Finally, we conducted a similar descriptive analysis, looking for new themes that could be found in each group separately.

Results: Seven themes were identified as influences on eating behaviors of Chilean women. "Family" was the most important influence. "Temporality" (day of the week, or season), "preferences", "financial issues", "special occasions", "some perceptions about food", and "availability of food", were additional themes. From a quantitative point of view, there was no difference between the themes in relation to the percentage of participants that mentioned that theme or the number of times that the theme was mentioned. However, from a qualitative standpoint, "family", "temporality", "financial issues", and "some perceptions about food", were themes that disproportionately affected obese and overweight women when compared to normal weight. Seven additional themes were found in the analysis by nutritional status (groups). "Psychological and emotional status", "health conditions", "physical appearance", "past experiences of failure", and "gender role" were themes found only in obese participants. "Perceptions of difficulties" and "obstacles for eating healthier" were themes found in both

obese and overweight participants. “Perceptions about the lack of time” was found just in normal weight participants.

Conclusion: This study identified a wide variety of factors (themes) influencing low-SES Chilean women’s eating behaviors. These themes seemed to vary in influence as related to nutritional status, most strongly affecting overweight and obese participants. These factors could potentially be targeted in future obesity-related interventions in Chile.

Our study supports the need to include the whole family in interventions that aim to improve women’s eating behavior as an attempt to prevent or control obesity. In addition, considerations and strategies that take into account the time of the year and the weekend should be included.

Finally, individual aspects should continue to be incorporated in obesity-related interventions target to low SES women in Chile, as perceptions, preferences, and emotional well-being, among other factors, continue to play a significant role in their *food world*, especially among overweight and obese women.

ACKNOWLEDGEMENTS

I would like to thank all those who have been part of this process – though the brevity of my words here cannot adequately express my great feeling of gratitude in this moment.

To start, I thank the Chilean government and the Fulbright Student Program for believing in me for giving me the opportunity to develop my academic career abroad. Along with this, I am very thankful to the University of Chile, especially the Department of Nutrition, that allowed me to keep my position there as a professor while I have been pursuing my PhD. Without these three institutions, my journey would have been very different.

I would like to thank all those people that were surrounding me and supporting me during these four years. I am eternally grateful for my family, especially my mother and my two dads, for being super supportive and for encouraging me all the time to do my best. I also have to mention my sisters and my brother, who have been always there to give me words of support. I still remember when I was preparing to take my plane to travel here, they held signs of encouragement, with the word “EXITO” (Success), as a surprise. I would summarize my feelings now just as: “I love you and thanks for everything”. I cannot leave out my extended family; my aunts, uncles, grandparents, and cousins. A big thanks to my grandfather who for sure has been taking care of me from heaven….

I am really thankful to all the people that I have met during this journey here in the United States. I have met really awesome people in Urbana-Champaign. My close friends here became my Champaign family. Special mention goes to my friends from the Chilean community here (the CHUCHAs): Carolina Hidalgo, May Cepeda, Macarena Pena y Lillo, Karla Palma, Cristian Cabalin, Marcela Vizcarra, Gaston Fernandois, Sergio Poo, Esteban Lopez, Catalina

Sandoval, Claudia Lagos among others. Of course, I really appreciate the support that other Chilean friends gave me from around the world: Alejandra Valencia, Oscar Canete, and Macarena Hurtado. In addition, I am immensely grateful to the one who not only helped me improve my English, but who was also really supportive in everything, especially in these last weeks, my boyfriend.

I am very grateful to my advisor, Dr. Schwingel. Since I arrived at her lab, she has given me all of her trust and support to participate in her research, as well as the guidance to pursue my program and conduct my own research. I am also thankful to the dissertation committee members, Dr. Graber, Dr. Andrade, and Dr. Chapman-Novakofski for their guidance and support during this process. Their comments from the proposal defense until today have significantly improved the current research. Additionally, an enormous “thanks” to the health care centers and community organizations that helped me with this research, as well as to each participant who shared their *food world* with me. Thank you very much to all of the Department of Kinesiology and Community Health staff, especially Pat Hawkins who always helped me with all my paperwork.

I would like to thank the ADLab members, especially Liliana Aguayo, Marcela Vizcarra, Kelechi Ibe-Lamberts, Julie Bobbit, and ex-members Dr. Wojtek, Emerson Sebastiao, Deborah Linares, and Brynn Adamson. All of them have contributed not just to my academic work, but also as friends and family… I will miss you all… I will miss our room 212b.

Finally, I would like to thank Prof. Margarita Andrade from the University of Chile, who helped me to see nutrition as a social science.

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CHAPTER 1

INTRODUCTION

During the past four decades, economic development has converged with the processes of urbanization, industrialization, and globalization. These processes have produced changes in the food economy and in dietary patterns (World Health Organization, 2014b), leading to what is called the "nutritional transition." In this nutritional transition, dietary patterns passed from traditional foods (based on grains, fruits, and vegetables) to manufactured, energy-dense foods (Fardet & Boirie, 2013). Swinburn, Caterson, Seidell, and James (2007) described it as follows: "ethnic cuisine and unique traditional food habits are being replaced by westernized fast foods, soft drinks and increased meat consumption" (p. 125). This has resulted in a significant increase in the share of the population consuming unhealthy diets and living with nutrition-related diseases (Astrup, Dyerberg, Selleck, & Stender, 2008).

Contemporary unhealthy diets include increased intakes of food along with high levels of fat, salt, and sugars, and limited amounts of vitamins and minerals (World Health Organization, 2016b). Unhealthy diets cause physiologic and metabolic changes linked to risk factors such as hypertension, obesity, hyperglycemia, and hyperlipidemia (Fardet & Boirie, 2013; World Health Organization, 2009a), conditions which can lead to non-communicable diseases (NCDs). NCDs are a public health priority worldwide. These diseases are the leading causes of death worldwide, and they also associated with declines in quality of life (Bloom et al., 2011). Individuals, families and societies pay a financial price for NCDs--with additional healthcare expenses and losses in productivity-- among other physical and mental health-related concerns (The Non-communicable Diseases Alliance, 2011).

Obesity is among the causes of these NCDs. In most countries, this problem disproportionately affects the poor, particularly women and the less educated (Hruschka, 2012). This has been linked to the fact that low socioeconomic (SES) individuals tend to have unhealthier eating behaviors when compared with people of higher SES (Inglis, Ball, & Crawford, 2005).

Chile is a middle upper-income country (World Health Organization, 2011b) located in South America. Chile urbanized rapidly starting in the 1990s, as a result of economic development (Albala, Vio, Kain, & Uauy, 2002). Chile's rapid economic growth brought changes in the population lifestyles; what was called "the nutrition transition" progressed very quickly in Chile (Vio, 2007). Currently, Chile is undergoing an advanced epidemiologic transition, and NCDs are the primary causes of mortality and morbidity (Gobierno de Chile, 2011). NCDs are responsible for about 83% of the total number of deaths (World Health Organization, 2011b) and constitute an economic problem for individuals, families, and the state. These diseases cost the government more than $4 billion per year. The largest single expense is related to lost productivity (Caro, Ramos, & Landerretche, 2014).

The major current public health concern in Chile, related with NCDs, is the high rates of people who are overweight (39.3%) or obese (25%) among adults ages 15 and older (Ministerio de Salud de Chile, 2010). The Organization for Economic Cooperation and Development (2014) states that Chile is among the ten countries with the highest levels of obesity in the world. Chilean women are more seriously impacted by obesity than men (30.7% versus 19.2%), whereas being overweight impacts more men than women (45 % versus 33%). Obesity is most prevalent among people 45 to 64 years of age, and people with limited education. This situation

worsens in low SES individuals, where the prevalence of obesity among both men and women reaches 35.5%. Almost 47% of low SES women are obese.

There is a direct association between eating behaviors and obesity-related NCDs (World Health Organization, 2016b). In Chile, information about eating behavior is scarce. The little information that does exist comes from the National Health Survey of 2010 (Ministerio de Salud de Chile, 2010) and preliminary data from a National Food Intake Survey conducted in 2010-2011 (Universidad de Chile, 2014). These surveys findings are the following: (a) the Chilean population has a high daily salt intake (96% greater than recommended by WHO; World Health Organization, 2014c); (b) only 15% of the total population (18% of women and 13% of men) consume the recommended amounts of fruit and vegetables (5 servings daily) (Ministerio de Salud de Chile, 2010); (c) About 53% of the total intake of fat is from saturated fat; (d) Chilean people do not meet the recommendations from the Chilean Dietary Guideline for water, dairy products, legumes, and fish; (e) people from low SES have higher calorie intakes than those of their more affluent counterparts (Universidad de Chile, 2014).

Several strategies have been proposed for addressing NCDs in Chile, first through prevention and treatment of obesity, and then by improving the Chilean diet across all ages. During the past decade, the Chilean government has invested time and resources promoting healthier eating among the population. An example of this is the adoption of the Global Strategy against Obesity from the Healthy Global Strategy on Diet, Physical Activity and Health (Ministerio de Salud - Gobierno de Chile, 2006; World Health Organization, 2004). Diet was added to the national strategic plan for fighting NCDs, particularly in prevention and treatment for obesity (Gobierno de Chile, 2011).

One strategy for improving eating behaviors involved public health education. Different settings have been used as delivery mechanisms for public educational programs. These settings included health care centers, schools, workplaces, and universities. In addition, new regulations intended to control the food production and sale have been implemented (Gobierno de Chile, 2011, 2012c).

Despite the increasing number of Chilean government incentives intended to promote healthy eating habits among the public, the prevalence of NCDs, particularly obesity, continues to rise according to data from national health surveys administered between 2003 and 2010 (Ministerio de Salud de Chile, 2010). For example, the prevalence of the obese and overweight populations (over 15 years old) increased from 61 to 67% during this period, and diabetes increased from 6.3 to 9.4%, during those seven years.

It is possible that these initiatives and interventions that have been implemented so far in Chile are limited in scope, lacking cultural competence related to the target behaviors. It is possible that health planners do not have the enough knowledge or information about the determinants of behaviors such as eating behaviors and physical activity. This fact could have led health care planners to develop limited or ineffective interventions. Sutton, Baum, and Johnson (2004) suggest that the lack of effectiveness of certain interventions can be due to the decontextualization of a target behavior, meaning that interventions do not consider how the target behavior is "culturally and structurally" maintained (p. 38). Therefore, understanding the factors that determine why and how a particular eating behavior is acquired and kept may play an important role in the success of public health interventions.

Behavioral science has developed models and theories that attempt to guide the development of interventions. In the field of nutrition, the Social Cognitive Theory and

Socioecological model are among the most used (Anderson, Winett, & Wojcik, 2007; Moore, Murphy, & Moore, 2011). These theories have been referred to as "frameworks for helping practitioners understand external and internal issues, and the dynamics that lead to behavioral changes" (Spahn, et al., 2010, p. 880). These theories inform health care planners about what they need to focus on in their interventions (Sutton, 2011); they indicate which determinants of behavior have the potential to be the focus of change.

Previous studies on the use of behavioral science in diet and nutrition have found external (contextual) and internal individual factors that influence eating behaviors. For example, Pridgeon and Whitehead (2013) state that the environment, personal responsibilities, the price of food, and the availability of certain foods are all key external factors that influence eating patterns. Research among US African-Americans has highlighted the importance of traditions, cultural contexts, the social meaning of food, and social network influences (Hargreaves, Schlundt, & Buchowski, 2002). In addition to contextual determinants, personal factors, such as preferences for specific foods, tastes, textures, and colors (Eertmans, Baeyens, & Van den Bergh, 2001), dietary knowledge, self-efficacy, and self-control (Lawrence et al., 2011) influence food consumption. The effects of both contextual and personal factors on eating behaviors vary according to socio-demographic factors, such as age, gender (Ares & Gámbaro, 2007), and SES (Inglis, Ball, & Crawford, 2008). To the best of our knowledge, very few studies from Latin America have employed behavioral science to understand eating behaviors (Banna, Buchthal, Delormier, Creed-Kanashiro, & Penny, 2015; Galvez, Valencia, Palomino, Cataldo, & Schwingel, 2015; Restrepo, Morales, Ramírez, López, & Varela, 2006).

Qualitative methods have been found to be useful in health research for studying human behavior. This type of research has the potential to answer questions about the "how and why of

certain behaviors" (Hargreaves, Schlundt, & Buchowski, 2002, p. 560). For instance, Inglis et al. (2005) used interviews to study the factors that were influencing women's diets. Lee, Kim, Oh, & Lee (2008) used focus groups to study mothers' perceptions about their children's diet. Among the qualitative approaches, Grounded Theory has been widely used. This approach allows for the generation of theories from the data, explaining the studied phenomenon (Charmaz, 2014).

Visual strategies have been used to complement qualitative research. It may be difficult for some people to express in words certain aspects of their behavior. Thus, visual methods, such as the use of pictures, can help overcome these barriers (Power, 2003). Pictures are representations of real life that allow other people to very directly view and immerse themselves into that reality. The content of the pictures, as well as the context in which the pictures are made, are both important (Rose, 2012). Some authors argue that pictures are important not only for what they are but also for "what it is that visual methods are able to achieve" (Knowles & Sweetman, 2004, p. 6). Wang and Burris (1997) state that this kind of technique "uses the immediacy of the visual image to furnish evidence and to promote an effective, participatory means of sharing expertise and knowledge" (p. 369). Photo-elicitation is a visual method that has attracted research interest in sociology, education, and health, among other fields. In this method, members of a community take pictures involving a theme. The pictures are then used during interviews as a discussion point concerning the theme (Gubrium & Harper, 2013; Rose, 2012). This method considers pictures to be records of reality, which can be a source of information for answering a research question. Photo elicitation is already being used to study eating behavior. For example, the study of mothers' diets, conducted by Johnson, Sharkey, McIntosh, & Dean

(2010), the study of women's access to healthy food, done by Valera, Gallin, Schuk, & Davis (2009), and the role of food in family relationships, conducted by Lachal et al. (2012).

In addition to qualitative methods, mixed methods has been shown to be a valuable research approach in health science. For Halcomb, Andrew, & Brannen (2009), mixed methods meets the needs of health care professionals for understanding the new challenges presented by contemporary changes in demographics, socioeconomics, and epidemiology. This method has been used to study the food shopping patterns of US African American women (DiSantis, Hillier, Holaday, & Kumanyika, 2016) and the food environment of college students (Campbell-Arvai, 2015). Therefore, a mixed methods approach could be useful for reaching a deeper understanding of the factors that influence eating behavior in Chile.

In summary, there is a dearth in information about factors that influence eating behavior in Latin America, and especially in Chile. Photo elicitation can be used to obtain detailed information about eating behavior, thus filling an important gap in the health literature, with implications for programs and interventions targeting obesity prevention in Chile. As low-SES women are more susceptible to developing obesity, a better understanding of eating behavior in this group could contribute to improve the health of this especially vulnerable population. Therefore, this study examined why low-SES women eat the way that they do, and how their nutritional status and the influences on their eating behaviors are related.

The specific aims of this research are to: (1) explore the influences on eating behaviors among low SES women living in Santiago-Chile; and (2) compare the influences on eating behaviors of low SES women who are normal weight, overweight, and obese.

This study is an important step toward understanding the eating behavior of the Chilean population, and it targets low SES adult women exclusively. In summary, the decision to look at

this specific population was influenced by four main reasons. **First**, the prevalence of obesity among Chilean women is 30.7%, versus 19.2% in men; plus in low SES women is nearly 47%. The fact that low SES women become obese more frequently than men is important, and may reflect especially to poor eating habits and vulnerability within this gender. **Second**, while women live longer than men, the extra years in which they live are often made difficult by the presence of NCDs. In addition, NCDs threaten both the health of women and the health of their children (The Non-communicable Diseases Alliance, 2011). **Third,** international organizations consistently address the vulnerability of women. The Non-communicable Diseases Alliance (2011) stated that "NCDs represent the biggest threat to women's health worldwide, increasingly impacting on women in developing countries in their most productive years" (p. 2), and have to be considered as priorities in women's health. Six out of ten women die due to NCDs. **Fourth**, targeting health improvements in women extends beyond improving just their health status; in many countries, women are the primary caregivers, often playing important roles as housewives, thereby influencing the behavior of other family members (Byrd-Bredbenner, Abbot, & Cussler, 2011). In addition, women are especially important in larger society for their productive and reproductive roles, and for their consumer and healthcare provider roles (The Non-communicable Diseases Alliance, 2011).

CHAPTER 2

LITERATURE REVIEW

2.1 Chile

2.1.1 The context

Situated in South America, Chile has a population of more than 16 million people (51.3% being women) distributed across fifteen regions (Gobierno de Chile, 2012a). The population resides mainly in urban zones (87%; Gobierno de Chile, 2012b). The highest concentration of the population can be found in the region known as "Metropolitana de Santiago," which contains more than 7,000,000 people (51.6% being women; Gobierno de Chile, 2012a).

According to data from the World Health Organization (2011c), Chile is considered a middle upper-income country. Its economy has enjoyed rapid growth during recent decades, is currently stable, and is one of strongest best in Latin America. The favorable economic situation in Chile has allowed for a reduction in levels of poverty, from about 40% in 1990 (poor and extremely poor people) to 15% in 2009 (Brandt, 2012). Now Chile is among the countries with the lowest rates of poverty in Latin America (Organization for Economic Cooperation and Development, 2011). Nonetheless, while at the national level, 15% of the population is poor, due to geographic disparities, the southern regions of the country experience poverty levels of over 20% (Gobierno de Chile, 2012b). Chile also has significant income inequality, considered one of the highest among the countries of the Organization for Economic Cooperation and Development (Central Intelligence Agency, 2016).

2.1.2 Demographic transition

Since the 1960s, Chile has experienced several changes in its population. People aged 15 years or younger decreased from 39.2% of the population in 1970 to 25.7% in 2002. By 2015, this group had decreased to 20.5% of the population. People over age 65 increased from between 5% of the population to 10.24% over between 1970 and 2015 (Central Intelligence Agency, 2016; Vio & Albala, 2003). Currently, most of the population falls between 25-54 years of age (43.2% [Central Intelligence Agency, 2016]). In most age groups, females outnumber males, with the greatest difference in the 65 years and older group (Central Intelligence Agency, 2016).

In addition, decreasing birth and general mortality rates have led to an advanced stage of demographic transition, in which Chile has become an aging society; this is a process which will only continue in coming years (Gobierno de Chile, 2012b). The pyramid of age can be observed in Figure 2.1.

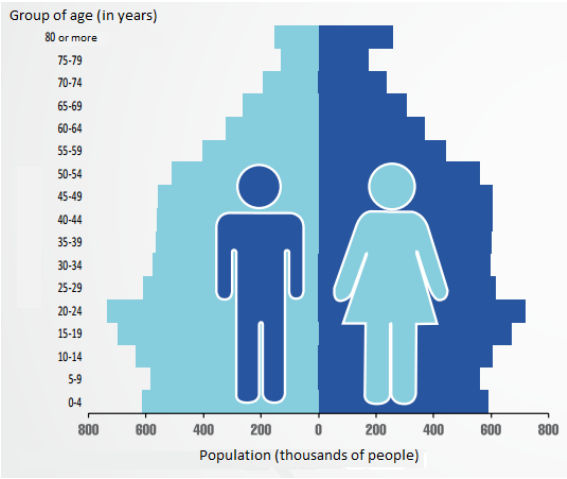


Figure 2.1 Chilean pyramid of age by sex. Adapted from Census 2012. Summary of results.

2.1.3 Epidemiological and nutritional transition: Current health status

Chile has made important advances in health. During the 1960s, there was a high prevalence of undernutrition, high maternal mortality, low life expectancy, and a high prevalence of infectious diseases (Vio, 2010; Vio & Albala, 2003). The formation of health policies, combined with strong economic development, have helped Chile to reach results in these indicators similar to much higher-income countries (Gobierno de Chile, 2011). Table 2.1 shows that basic health indicators in Chile are better than the average for Latin America and the world. These indicators in Chile are very similar to those that can be found in developed countries such as the United States.

Table 2.1. Comparison of basic health indicators.

	Chile (The World Bank, 2014)	Latin American (Pan American Health Organization & World Health Organization, 2013)	USA (The World Bank, 2014)	World (World Health Organization, 2013d)
Infant mortality rate (per 1,000 live births)	8.1	16.3	6	35
Mortality rate, under-5 (per 1,000 live births)	9	19.7	7	48
Maternal mortality rate (per 100,000 live birth)	25	80	21	210
Life expectancy at birth, females (years)	82	78.1	81	72
Life expectancy at birth, males (years)	76	71.9	76	68
Life expectancy at birth, (years)	79	75	79	70

According to the last National Health survey, 65.5% of the population considers their health status to be good or very good, while 4.8% consider it to be bad or very bad (Ministerio de Salud de Chile, 2010).

Economic development in Chile has brought significant changes in the population's lifestyle, as has happened in other parts of the world. These changes in lifestyle, in addition to demographic variations, have guided Chile toward an advanced epidemiologic transition in which NCDs are the main causes of death (Gobierno de Chile, 2011). As reported in 2008, NCDs produced about 83% of the total deaths in Chile (World Health Organization, 2011b). These diseases cause 84% of disability-adjusted life years in the country, being higher in women than men (more than 1,9 million years versus more than 1,8 million years; Morgado, 2011).

As is shown in Table 2.2, cardiovascular diseases (CVDs)—mainly ischemic heart and cerebrovascular disease—are the leading causes of death in Chile, producing about 24,000 deaths per year. CVDs have been the leading cause of death since 2000. CVD-related death rates have increased from 15% in 1970 to 28% in 2007. Currently, according to criteria from Adult Treatment Panel III (ATP III; National Institutes of Health, 2002), 17.7% of the total population in the country have a high cardiovascular risk (men 20.5%; women 11.9%). The population with the highest cardiovascular risk is those older than 65 years (48%), followed by the group between 45 and 64 years (Ministerio de Salud de Chile, 2010). Despite these figures, the risk of death by CVDs has decreased from 161.8 per 100,000 people in 1998 to 136.6 in 2007, due to policies and strategies from different governments (Gobierno de Chile, 2011); nonetheless, the conditions that favor CVDs continue to be present.

Table 2.2. Percentage of total death in Chile by causes, in 2000 and 2010.

Cause	2000	2010
Cerebrovascular diseases	9.5	9.1
Ischemic heart disease	9.7	8.0
Cirrhosis and other liver diseases	4.4	4.4
Hypertensive diseases	2.9	4.1
Pneumonia	5.4	4.0
Diabetes mellitus	3.2	3.8
Chronic respiratory diseases	2.9	3.6
Malignant neoplasm of stomach	3.8	3.4
Others	58.1	59.8

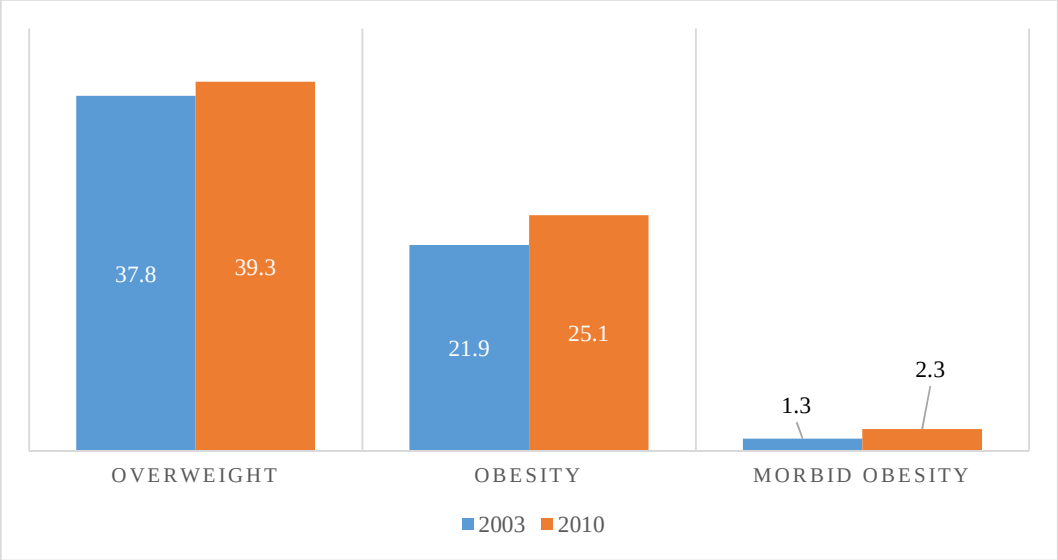
Source: Departamento de Estadistica en Salud- Gobierno de Chile, 2010

The nutrition status of the population has changed rapidly since 1970. By 1980, Chile reduced the prevalence of undernutrition to near eradication. By the middle of the 80s, however, due to an economic crisis, undernutrition increased again, even while obesity became an issue during this same period. In the years that followed, along with the urbanization process, high obesity rates were observed due to changes in diet (higher intake of caloric density diet) and physical activity patterns (more sedentarism) (Vio & Albala, 2003). These changes took Chile to a "post nutritional transition" period (Vio & Salinas, 2006), in which problems with obesity and other risk factors and diseases related to an unhealthy diet became more prevalent.

According to the last Chilean National Health Survey (Ministerio de Salud de Chile, 2010), more than 67% of the population is considered overweight or obese. This figure is 6 points higher than a previous survey done in 2003. Those considered overweight represented

39.3% while those considered obese represented 25%; both figures are higher than previous 2003 data (Figure 2.2).

Figure 2.2. Prevalence of overweight and obesity, 2003 and 2010.



Source: Adapted from Ministerio de Salud de Chile, 2010

This last survey also indicated that women are more affected by obesity than men (30.7% versus 19.2%), while being overweight affects more men than women (45% versus 33%). Furthermore, morbid obesity affects more women than men (3.34% versus 1.26%). Obesity disproportionately affects people between the ages of 45 and 64, especially women, where the rate of obesity reaches about 50%. The prevalence of hypertension at a national level is 26.9%, a figure that is actually lower than in 2003 (33.7%). Men are slightly more affected by this disease than women (28.7% versus 25.3%). The prevalence of diabetes also increased from 2003 to 2010, from 6.3% to 9.4%. Women have the highest prevalence of this disease, reaching 10.4%, versus men at 9.4% (Ministerio de Salud de Chile, 2010). People from low SES are more

affected by obesity, hypertension, and diabetes; conditions that all affect more women than men (Ministerio de Salud de Chile, 2010).

In addition, 40.6% of the Chilean population smokes, with women smoking at a lower rate men (37.1% versus 44.2%). About 89% of the Chilean population is considered sedentary, and women are more sedentary than men (92.9% versus 84% [Ministerio de Salud de Chile, 2010]).

2.2 Eating Behaviors and Their Importance to Health

Eating behaviors are considered key elements of health. Through the kinds of food that we eat and the way that we eat it, we can consume the nutrients that allow us to grow and develop. However, unhealthy eating behaviors can also contribute to several diseases due to either a lack or an excess of certain nutrients. Today, eating behaviors—especially those related to an unhealthy diet (increased intake of food with high amounts of fat, salt and sugars, and low amounts of vitamins and minerals)—have attracted the attention of several researchers. An unhealthy diet has been noted by the WHO as "a major modifiable determinant of chronic disease" (World Health Organization & Food and Agriculture Organization, 2003, p. 2), implying that it is a reversible condition. This kind of diet is considered part of a "Western lifestyle," which has been associated with the rapid increase of the prevalence of diabetes and obesity (Fardet & Boirie, 2013).

Many researchers have recognized that during the process of industrialization, urbanization, economic development, and globalization, changes in dietary patterns are common. Due to the improvement in living conditions, more foods become available, and they are more diverse. Food has become a truly globally-distributed product. These changes in food markets

have contributed to the move away from traditional foods toward processed, calorie-dense foods, a process known as nutritional transition (Fardet & Boirie, 2013). This nutritional transition includes changes in both the amount and quality of food that populations consume, which in turn increases the number of people maintaining an unhealthy diet. This, when added to other unhealthy lifestyles such as inactivity, impacts the nutritional status of the population which has become increasingly obese and at higher risk of NCDs (World Health Organization & Food and Agriculture Organization, 2003). For this reason, diet has been a high-priority area of intervention at the international level (Beaglehole et al., 2011).

An unhealthy diet, combined with tobacco use, physical inactivity, and the harmful use of alcohol, accounts for about 80% of cardiovascular diseases (World Health Organization, 2010). The problem with the chronic consumption of an unhealthy diet is that it produces physiologic and metabolic changes that are linked to hypertension, being overweight, obesity, hyperglycemia, and hyperlipidemia (Fardet & Boirie, 2013; World Health Organization, 2009a). These conditions are all root causes of NCDs. For example, hypertension has been associated with 45% of deaths from heart disease and 51% of deaths by stroke around the world (World Health Organization, 2011a). Being overweight or obese correlated to 44% of the diabetes cases, 23% of the cases of ischemic heart disease, and between 7 and 41% of some cancers (World Health Organization, 2013a). In addition, obesity is related to respiratory and joint diseases (Fardet & Boirie, 2013). It has been estimated that close to 7.9% of the population between the ages of 20 and 79 have impaired glucose tolerance, and 70% of those individuals will eventually develop diabetes (International Diabetes Federation, 2009).

Despite a well-documented association between eating behaviors and the development of NCDs, to date it is unclear as to the prevalence of an unhealthy diet in the general population.

However, there is widespread evidence about the relationship between specific eating behaviors and health (World Health Organization, 2016b). For instance, about 1% of all Disability Adjusted Life Years (DALYs) and 2.8% of deaths in the world are caused by an inadequate intake of fruits and vegetables. The consumption of fruit and vegetables has been associated with decreased risk of cardiovascular disease and some types of cancer, due to their content of vitamins, minerals, and fiber (World Health Organization, 2016b). Also, low intake of fruit and vegetables has been associated with an excess intake of high-energy dense food (Ledikwe et al., 2006). This excess of energy intake without a comparable expenditure results in an accumulation of body fat, which is associated with overweight and obesity (Fardet & Boirie, 2013; World Health Organization, 2016b). Furthermore, high intake of salt is associated with higher blood pressure and higher cardiovascular risk (World Health Organization, 2016b). Data indicated that populations in several countries are consuming more than 5 grams of salt per day (WHO's recommended intake). At a global level, it is estimated that the population has an intake of 9 to 12 g of salt per day, representing a high risk for cardiovascular health (World Health Organization, 2016b). Evidence suggests that decreasing salt intake to about 6 g/d could prevent more than 2 million deaths per year, globally (Lachat et al., 2013). Finally, the intake of saturated and trans-fat is associated with a risk of cardiovascular disease. In contrast, an intake of polyunsaturated and unsaturated fatty acids is associated with better cardiovascular health and is a protecting factor for type 2 diabetes (World Health Organization, 2016b).

According to the World Health Organization and the Food and Agriculture Organization (2003), diet and nutrition are fundamental to the promotion and maintenance of good health. Their role as risk factors for NCDs is well known, and for this reason numerous strategies exist to focus on improving food intake in the population. Currently, fruit and vegetables, salt/sodium,

fatty acid, trans-fats, sugar, and total calorie intake are key elements of the diet that have been considered to prevent and treat NCDs. These can be observed in the "Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2020" (World Health Organization, 2013c). It is important to consider that strategies for improving eating and other behaviors which are also risk factors should include efforts from several sectors such as health, agriculture, finance, trade, education, and transport, among others (World Health Organization, 2013b).

2.3 Women's Health and Eating Behaviors

Women's health has been recognized as being a priority in the world (Ribeiro, Jacobsen, Mathers, & Garcia-Moreno, 2008), but at the same time it represents a challenge to the governments of different countries. One reason for this is that women have a longer life expectancy than men, due to biological and behavioral factors that favor them. As such, women have different needs than men (World Health Organization, 2009b). A second reason is that women's needs vary according their race, ethnic, socioeconomic, cultural, and demographic backgrounds. In this same sense, it is necessary to take into account the stage of life in which women find themselves (Lewis, La Rosa, Bader, Garfield, & James, 2010).

It is well-known that women face problems related to poverty, malnutrition, HIV/AIDS, violence, and maternal morbidity and mortality—areas in which governments and global health organizations have put significant resources and effort (Lewis et al., 2010). Nonetheless, NCDs are also now affecting women as a result of urbanization and development (World Health Organization, 2009b). Globally, just as with men, women die primarily due to NCDs: six out of ten women die due to these diseases.

Cardiovascular diseases (CVDs) are the main NCDs that kill women, killing more women than men each year in developing countries (Coulter, 2011). DALYs and mortality due to CVDs also increase with age, representing 82% of women's deaths over the past 45 years, while causing 25% of the deaths in women between 15 and 44 years of age (Ribeiro et al., 2008). The rates of deaths due to CVDs are higher in low and middle-income countries than in high-income countries. In Chile, for example, 28.5% of total deaths are due to CVDs (Instituto Nacional de Estadistica, 2013). The higher rates of death in these countries could possibly be due to cases of CVDs in women that have not been diagnosed or recognized. This is because CVDs have different symptoms in women than men, and because women are less likely to seek help from the health care system (World Health Organization, 2014a). Some low-income countries may have less access to treatment for diseases such as diabetes or hypertension that are big risk factors for CVDs (Ribeiro et al., 2008).

Studies about eating behaviors in adult women have shown that African American women tend to consume food with high content of fat, sodium, calories, and cholesterol combined with low intake of food with fiber (Hargreaves, Schlundt, & Buchowski, 2002; James, 2004), due to factors like personal, cultural, and environmental contexts. Other studies on UK women indicated a low intake of food with important micronutrients such as vitamin D, calcium, and folate; this was combined with high intakes of food with saturated fat and low intakes of fruits and vegetables (Ruxton & Derbyshire, 2010). Chinese American women have been seen to manifest a low intake of calcium-rich foods (Lv & Brown, 2011), while Korean women born in the US tend to eat more whole grains, red meat, and nuts, but less fruits and vegetables, than women born in Korea (Park, Murphy, Sharma, & Kolonel, 2005). A study of diet quality in Chilean women showed that women have a low intake of vegetables and a middle intake of fruits

and dairy products (Pereyra & Erazo, 2011). According to the last Chilean health survey, only 18% of women population over 15 years of age meet the recommended servings of fruit and vegetables (5 servings per day; Ministerio de Salud de Chile, 2010). These data seem to indicate that women from a variety of cultural contexts are vulnerable to NCDs due to their unhealthy diets.

2.4 The Influences of Eating Behaviors in Women

2.4.1 Theories and models that help to understand the influences of behaviors

From the behavioral sciences, several models and theories have been created to help health planners make decisions about how best to help people change their behaviors (Spahn, et al., 2010). The socioecological model (SEM) and the Social Cognitive Theory (SCT) are two of these theories that researchers have used to study eating behaviors (Moore et al., 2011; Williams, Thornton, & Crawford, 2012).

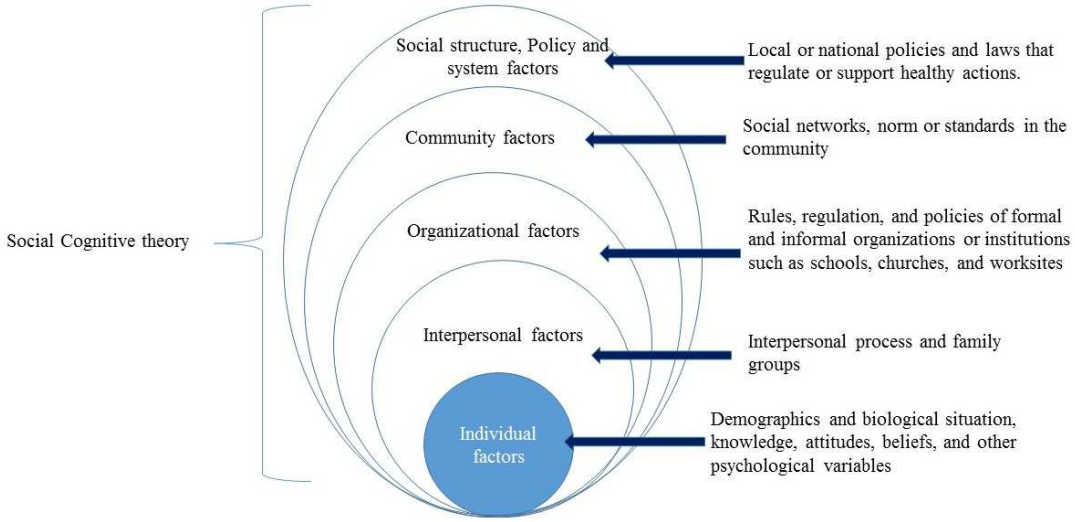
The SEM gives priority to the environment and policy context of where the behavior is performed, but it also considers social and individual influences on how the behavior is formed, and with regard to how all levels interact with each other. Individual, interpersonal, organizational, community, social, and policy factors are considered by SEM (Glanz, Rimer, & Viswanath, 2008). The individual level (or intrapersonal level) includes the behavior studied, the knowledge that the individual has, some attributions, and beliefs. The interpersonal level involves the interactions or relationships that the individual can have with others, such as family, friends, etc. The organizational level represents all the influences that can be present in the organizations in which the individual belongs. These organizations can be schools, workplaces, religious institutions, et al., that have rules and norms which can affect the individual's behavior. The community level can be a mixture of the other three levels of the SEM, but is defined by

geography, politics, norms, and internal community rules. Finally, the social structure, policies, and system involve the environment that surrounds individuals and their communities. It includes policies and laws that could affect behavior (Center for Disease Control and Prevention, 2013; Glanz et al., 2008; Gregson et al., 2001).

Similarly, SCT emphasizes reciprocal determinism, meaning that there is an interaction between people, their behaviors, and their environments. SCT underscores the fact that behaviors are a result of the interaction between personal, behavioral, and environmental influences. This theory considers: *psychological determinants,* such as outcomes, expectation, self-efficacy, collective self-efficacy, and observational learning; *environmental determinants,* which include incentive motivation and facilitation; *self- regulation,* which is related to self-monitoring, and which includes goal-setting, feedback, self-reward, self-instruction, and enlistment of social support; and finally, *moral disengagement* (Glanz et al., 2008).

Both theories previously mentioned have been mixed to set the theoretical framework of this research. Due to the fact that the SEM includes a broader point of view, it formed the basis for the theoretical framework, while constructs from SCT were added, as shown in Figure 2.4.

Figure 2.3 Scheme of the Integration of Health Behavior Theories.



Source: Adapted from Gregson et al., 2001

2.4.2 The Influences of Eating Behaviors in Women

To follow, the different influences of eating behaviors have been organized according to the SEM levels.

2.4.2.1 Individual level

Preferences

Food preferences are one of the most important influences on food choice and intake. Individuals frequently eat foods they prefer, and infrequently eat those foods they dislike (Evans, McNeil, Laufman, & Bowman, 2009). According to Rozin and Schulkin (1990), when there are no other barriers, such as price or availability, preference (or how a food is perceived by people) becomes the most important predictor of food intake. These preferences are dependent on the taste, smell, texture, appearance, temperature, as well as others characteristics of food which people perceive (Eertmans et al., 2001).

In a study of African American women in United States, eating behaviors were associated with foods that they typically ate and enjoyed. In focus groups, authors found 43 items related to preferences. Among the more prevalent were those preferences for healthy food (13 items), meat and potatoes (10 items), and those related to unhealthy food (9 items) (Hargreaves et al., 2002). Williams, Ball, and Crawford (2010) conducted a study with 355 women of low socio-economic status and they found that the preferences for fruits and vegetables, expressed by a high taste for them, were associated with a higher intake of fruits and vegetables. Similarly, in a study on healthy women, aged 20 to 41 years, the preferences explained 32% of the variance in the frequency of food intake. For the foods that women "almost never" or "never" ate, food preferences did not correlate with the frequency. Low preference scores were associated with low frequency of intake, and vice versa. Food preferences also predicted the nutrient intake, along with the intake of fat, fiber, and vitamin C. Interestingly, different results were found in another study in which 185 African American women answered a questionnaire about their food preferences. In this study, preferences for healthy food were negatively correlated to the intake of low-fat food, but this was explained by authors as a difference between women's preferences and what they really eat (Evans et al., 2009). This study also showed that preference was the most important predictor in the regression analysis for the intake of low-fat foods (Evans et al., 2009).

Personal experiences

There are two kinds of personal experiences that influence eating behavior: childhood experiences and current experiences. Women have reported that their childhood experiences were critical in forming eating behaviors kept until adulthood. Studies have shown that the use of food as a positive reinforcement or as a punishment during childhood can also influence adult behaviors (Sawkill, Sparkes, & Brown, 2013). The use of food as a means of comfort for

children has also been shown to be associated with more emotional eating in adulthood (Brown, Schiraldi, & Wrobleski, 2009). Overall, what women learned in childhood influenced their eating habits. For example, one Latino woman, explaining why she did not leave anything on her plate, stated that "We are taught [from a young age] that we need to eat everything that is served and should not get up until food is finished" (Greaney, Lees, Lynch, Sebelia, & Greene, 2012, p.450-451).

On the other hand, current experiences—such as life changes—were mentioned as a reason that women lose ingrained eating habits or start new ones (Sawkill et al., 2013). Smith-Dijulio, Windsor, & Anderson (2010) found that women who experienced previous healthy eating habits said that they maintained these behaviors in later life. They expressed this through phrases like "I always ate healthily." In this study, life experiences were also mentioned in the context of the different roles that women play: "mother," "wife," "housewife," and "woman," more generally. Women mentioned that during their lives, as their roles changed, they also had to change their behaviors and what they wanted to do.

Familiar traditions can also influence eating patterns in women. For example, African American woman report that eating fried food, high fat foods, and sweets are part of their tradition, proving challenging when they try to eat healthier (Hargreaves et al., 2002; James, 2004). It has also been shown that traditions about food pass from one generation to other, especially from mother to daughter (Wilson, Musham, & McLellan, 2004).

Educational attainment

Educational attainment is understood as the highest level of academic qualification that a person receives (Robinson et al., 2004). The educational attainment of women is directly correlated with diet (Barker, Lawrence, Woadden, Crozier, & Skinner, 2008; Robinson et al.,

2004). For example, in a sample of more than six thousand women between the ages of 20 and 34, in which socioeconomic and anthropometric measures were related to diet, educational attainment was the most important influence on women having a healthier diet. Educational attainment alone accounted for 19% of the variance in diet. Accordingly, women with lower educational attainment had a relatively poor diet (Robinson et al., 2004). Irala-Estevez et al. (2000) indicated that women with a higher level of education ate an additional 33.6 g/person/day of fruits and 17.1 g/person/day of vegetables, when compared to women with a lower level of education. These findings contrast with a study of African-American women, in which the diet of women with a higher level of education was not better than that of women with a lower level of education (Evans et al., 2009).

Barker et al. (2008) state that the relationship between educational attainment and diet is not as simple as it seems, because other variables could be involved. For instance, women with a lower level of education have low income, and this factor could prevent them from buying certain kinds of food (Dowler & Calvert, 1995). Lawrence et al. (2009) found that women with low educational attainment thought that the price of food was a barrier to eating healthier, and they also held the belief that the healthy foods were more expensive.

Barker et al. (2008) further hypothesized that women with low educational attainment tend to have other worries and thus a relatively poor involvement with food. They tested this hypothesis using a scale to measure the food involvement, and then related this with diet and educational attainment, in a sample of women from Southampton, England. They found that women with low educational attainment also had low scores in the scale of food involvement. This study also found that women with lower education qualifications ate less fruits and vegetables, and that food involvement was not a factor in this relationship. These researchers

also found that women who had low educational attainment held perceptions of having less control over their lives, and also had less healthy diets (Barker et al., 2008). But educational attainment and sense of control had independent effects on women's diets. The perceived control was not related to diet, in women with higher educational levels (Barker et al., 2009). Other findings from this group also suggest that some psychological and social variables act differently in women, depending on their level of education. For instance, Lawrence et al. (2011) found that women with lower education levels had less social support for eating healthier, had less self-efficacy, and had fewer positive outcome expectancies for healthy eating. No effect was observed with self-efficacy and outcomes expectancies in the diets of women with higher educational attainment. Lawrence et al. (2009) stated that women with higher educational attainment had partners who were more supportive with regard to healthier eating, and with who they shared more food preferences. A more positive attitude toward healthy eating was observed in those women who reached a tertiary level of education (Hearty, McCarthy, Kearney, & Gibney, 2007).

Studies on the intake of specific foods have demonstrated that educational attainment is an important factor. Leganger and Kraft (2003) studied how education influenced fruit and vegetable intake in a group of more than three hundred women. Education explained 10.2% of the intake of fruit and vegetables, with the more highly educated women displaying more self-efficacy and greater intent to eat fruit and vegetables.

Knowledge in nutrition and food

Nutritional knowledge is an important factor in promoting healthy eating (Petrovici & Ritson, 2006). Greaney et al. (2012) found that among Latino immigrants in the US, the lack of knowledge in nutrition is a barrier to eating healthier. Williams et al. (2010), found that women

with a low socioeconomic level who have more knowledge about cooking, ate more fruits and vegetables. Fruit and vegetable intake was also associated with nutritional knowledge in Belgian women, but no relation was found for other eating behaviors (De Vriendt, Matthys, Verbeke, Pynaert, & De Henauw, 2009). In another study, women used their knowledge to select better food for themselves and their children (Dammann & Smith, 2009). Rustad and Smith (2013) indicate that an educational intervention in low income women increased vegetable intake, the reading of nutritional labels, and the preparation of healthier meals. They also found that women decreased fast food intake, some processed food consumption, and the intake of meat with high content of fat (Rustad & Smith, 2013). The use of food labels was also associated with nutritional knowledge among women in Shiraz, Iran (Ahmadi, Torkamani, Sohrabi, & Ghahremani, 2013). In contrast, Williams et al. (2012) found that among their study participants that high nutritional knowledge was not associated with higher fruits and vegetable intake or energy-dense snacks intake, but that it was correlated with decreased fast-food consumption.

Some concepts about nutrition and food are better understood than others. For example, a study of Senegalese women showed that they have more knowledge about issues related to fat and obesity and its health consequences than about issues related with salt and fruit and vegetable intake (Holdsworth et al., 2006). Another study, done primarily with women in three Latin American countries, found that some participants did not know what sodium was and that it was present in processed foods. In addition, participants said that they eat moderate amount of salt and only people who ate a lot of this nutrient experienced health risks (Sanchez et al., 2012)**.**The fact that people do not know that sodium is in several kinds of food and the consequences that it has for health puts them at high risk for some chronic diseases, because they may eat more food with this mineral in it unknowingly. Damman and Smith (2009) also found

that women experienced some confusion about food groups, while other researchers found that women do indeed know about the role that eating behaviors play in gaining weight (Befort, Thomas, Daley, Rhode, & Ahluwalia, 2008).

In a study of the determinants of nutritional knowledge, women's age, educational level, and if they were or were not a smoker were associated positively, while Body Mass Index (BMI) was negatively associated (De Vriendt et al., 2009). Dressler and Smith (2013b) stated that lean/normal women had more knowledge about nutrition than overweight/obese women, even mentioning specific nutrients. Even further, some overweight/obese women showed an indifference toward, or a lack entirely, of nutritional knowledge.

Emotions

Emotions can influence both the kind and the amount of food women eat, as foods could be used as media for changing some feelings (Hayman, Lee, Miller, & Lumeng, 2014). Elfhag and Morey (2008) identified four categories of influence when studying eating behaviors in African American women through focus groups. These categories were "negative emotional eating, positive emotional eating, general mood effects, and eating less when emotional" (p. 140). Negative emotional eating was related to bad moods in women: for example, "When I have had a hard day, I like to indulge in foods like cookies, candy bars, or ice cream" (p. 140). Sawkill et al. (2013) found, similarly, that women, after a hard time at work, used food as a reward. For example, one woman said, "I have done such and such and so let's sit down and have a chocolate bar and a cup of tea and watch TV" (p. 82). In contrast, positive emotional eating was related to good mood: for example, "I eat more when I am happy and celebrating" (Elfhag & Morey, 2008, p. 140). When women did not express a determined mood that made them eat more or less, the

researchers referred to this as “general mood effects.” Finally, women stated that under some emotional states they ate less. Overall, there were some differences in the kind and amount of food that women ate when they were happy or sad (Elfhag & Morey, 2008).

Most studies about emotions have examined so-called “emotional eating.” Hargreaves et al. (2002) define emotional eating as a “response to negative emotions such as depression, disappointments and feelings of loneliness” (p. 285). This kind of eating is related with higher weight and the intake of unhealthier food. For Verstuyj, Vansteenkiste, Soenens, Boone, & Mouratidis (2013), emotional eating was related to binge eating, which can lead to being overweight or obese. In fact, it was found that obese women used emotional eating to control their emotions, and that this was related to emotional awareness (Rommel, D., Nandrino, J.-L., Ducro, C., Andrieux, S., Delecourt, F., & Antoine, P., 2012).

Hernandez-Hons and Woolley (2012) defined emotional eating as “turning toward food to self-soothe instead of seeking human connection for comfort or effectively self-soothing” (p. 590). They studied this kind of eating in obese women and found that they understood emotional eating as eating with the goal of feeling happier and “eating to fill an emotional void” (p. 593). Women also used food as a substitute, a diversion, a way to remember the past, or as a link with their partners.

Differences in the influence of emotions have been found between obese women and normal weight women. Dressler and Smith (2013a) indicated that obese women used food as a coping mechanism related to negative emotions more often than normal weight women did with these same emotions. As a lean woman said, “I starve myself when I’m stressed. I just can’t eat, like, if I try to eat while I’m thinking about what’s stressing me out then I just throw it up” (p. 149).

Self-control

Self-control is the perceived belief that one can control one's behaviors (Redden & Haws, 2013). It has been seen as an important factor in the adoption of healthy eating (Lawrence et al., 2011). Elfhag and Morey (2008) pointed out that a lack of self-control was an important factor in the intake of food under negative emotions and when there was an external food stimuli.

Self-control can be a mediator in quality of diets in women with low education (Barker et al., 2009). Lawrence et al. (2011) found that general perceived control was positively associated with a healthier diet in women with low educational attainment but not in those with higher educational attainment.

Self-control is related to conceptions of self-regulation. According to Self-Determination theory, there are two types of regulation: autonomous and controlled regulation. In the first, a sense of responsibility and choice are involved. Controlled regulation is related with the control from oneself or others and it is related to eating disorders. Studies show that women with more autonomous regulation have healthier eating habits (Leong, Madden, Gray, & Horwath, 2012; Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004). Anderson, Winett, & Wojcik (2007) indicated that self-regulatory strategies such as planning and tracking healthier eating were associated with less intake of fat and higher intakes of fiber, fruits, and vegetables.

Barker et al. (2009) indicated that women had a lack of self-control over some eating behaviors due to low support from their parents and their children, and the price of food. Barberia, Attree, & Todd (2008) found a similar pattern in Spanish women who were in a weight loss intervention. Women expressed that a lack of willpower, having to cook, hunger, some difficulties in changing the way that they used food, a lack of time, and food-related temptations reduced the perception of control over eating behaviors.

Self-efficacy

Self-efficacy is "the belief about personal ability to perform behaviors that bring desired outcomes" (Glanz, Rimer, & Viswanath, 2008, p. 171)**.** It has been related to complex behaviors such as eating and physical activity. High self-efficacy related to making daily, healthy food choices have been associated with better quality of a person's diet (Anderson et al., 2007). Anderson et al. (2007) found, in a sample mainly composed of women, that those with higher levels of self-efficacy ate lower amounts of fat and higher levels of fiber, fruits, and vegetables. Similarly, other studies have found that women who had more self-efficacy for healthy eating ate more servings of fruits and vegetables (Williams, et al., 2010; Williams, et al., 2012). Williams et al. (2012) also found that self-efficacy for healthy eating was associated with reducing intake of fast-food and energy-dense snacks.

Self-efficacy was related to nutrition but as a mediator to other variables such as self-regulation and negative outcome expectations. A high level of self-efficacy leads to fewer negative outcome expectancies about choosing a healthy diet, while also leading to more self-regulatory strategies related to healthy food (Anderson et al., 2007). Lawrence et al. (2011) showed that general self-efficacy (not related with a specific behavior) did not have a direct effect on diet, but it did have a direct effect on general perceived control and food involvement in women of low educational attainment. In women with higher education, general self-efficacy only effected general perceived control. Anderson, Winett, and Wojcik (2000) also showed an effect of self-efficacy in diet but through physical outcome expectations, with the latter having the best effect on nutrition in a sample of shoppers (96% females). In this study, high self-efficacy was related to positive expectations about healthy eating in their budget and the

satisfaction with food that they bought. Having children was associated with lower self-efficacy for a healthy diet.

Motivation

Motivations can be the reasons that people engage or don't engage in a behavior. Motivation includes "factors influencing the individual to attend to, and act upon, information and knowledge" (Glanz et al., 2008, p. 373). Motivation is associated with outcome expectations concerning the behavior that one desires to engage in. Sun (2008) indicated that some motives to select food could be, among others, "health, convenience, mood, sensory appeal, weight control, price, natural content and ethical concern, and familiarity" (p. 44). The study found that the most important motives to select food were price, sensory appeal, and mood; the least important was weight control. In a comparison between overweight/obese and lean/normal women, Dressler and Smith (2013a) showed that health was a motivation to select certain foods in lean/normal women, while in overweight/obese women the main motivation was cost. Inglis, Ball, & Crawford (2005) pointed out that health, cost, and ease of preparation were mentioned as a motivation for purchasing food.

In Hargreaves et al.'s study (2002) of African American women, motivation was mentioned in relation to why women cook or do not cook. Some of them were motivated to cook new foods and to use new techniques; for others, cooking was not a motivation. Motivation was also related to health awareness and explains why some women choose healthy food. Among the quotes that illustrate this point, the authors included the following: "I feel better when I cook the right way," and "I am concerned about eating healthy foods in order to prevent heart disease" (p.138). Motivation to buy food included "desire for a specific food," "to satisfy a craving," and "to satiate hunger."

Motivation to meet others' expectations also influences what women eat. For instance, Barberia et al. (2008) pointed out that women involved in weight loss treatment were motivated to follow the determined diet because they wanted meet their health care provider's expectations.

Mental health

Mental problems such as chronic stress, depression, anxiety, and low self-esteem have been associated with changes in eating behavior. Stress has also been associated with the problems of obesity and being overweight (Mouchacca, Abbott, & Ball, 2013). Moore & Cunningham (2012) suggest that in addition to biological changes, stress changes eating behaviors toward those with a higher mean intake of calories, especially among people individuals of lower socioeconomic status. For instance, under stressful situations, people eat fewer vegetables (Tsutsumi et al., 2003), and tend to eat more fatty and energy dense foods (Adam & Epel, 2007). Main sources of stress for women tend to be their work, their family, and among working women, trying to balance the demands of both family and work (Ortega, Abdullah, Ahmad, & Ibrahim, 2013).

One study on low socioeconomic status shows that women who experience high levels of stress also tend to have a relatively unhealthy diet (Moore & Cunningham, 2012). Another study of disadvantaged women pointed out that the presence of stress was associated with a higher intake of fast food. This kind of intake was indicated by the authors as "comfort or rewards food" to cope with the stress (Mouchacca et al., 2013, p. 9). In addition, in contrast with women with lower level of stress, stressed women preferred eating sweet foods rather than salty foods, but they also ate more fatty foods (Habhab, Sheldon, & Loeb, 2009). Ortega et al. (2013) found that in working women stress was associated with the expression "I eat such a quantity of food that I end up feeling very stuffed" and "[I feel the] urge to snack when I feel pressure" (p. 16). In

addition, 60% of the women with high levels of stress agreed with the statement, “eating makes me feel better when lonely.” Habhab et al. (2009) reported that women with high levels of stress also ate more food than women with lower levels of stress.

According to data from World Health Organization (2012), depression affects more women than men and is associated with obesity, indicating that depressed people can also have an unhealthy diet (Schneider, Baldwin, Mann, & Schmitz, 2012). Costanzo and Musante (1996) indicate that women overeat when they are depressed or have feelings of loneliness. Binge eating is also associated with depression in obese women (Schneider et al., 2012).

Anxiety is another mental health problem that is more frequent in women than men (World Health Organization, 2012); it is also more prevalent among obese people than among those of normal weight (Bulik, Sullivan, & Kendler, 2002). Anxiety has also been associated with excessive eating (Davenport, Houston, & Griffiths, 2011) and binge eating in obese women (Bulik et al., 2002). Even normal weight women experience binge eating when experiencing depression and anxiety (Webber, 1994).

Low self-esteem is another factor that can influence the way people eat. Low self-esteem is associated with higher needs of external control for people in their diet. People with low self-esteem are also less able to face challenges or temptations with their diet (Davenport et al., 2011). A few studies show how self-esteem affects eating behavior in women, but most show that there is an association between low self-esteem and obesity (Laska, Graham, Moe, & Van Riper, 2010).

Perceptions about Time

In general, women mentioned the time factor as a barrier to eating healthier. The lack of time (or the feeling of the lack) increases the consumption of fast food, decreases home-made

food, decreases the time that family spends together during meals, and increases the consumption of ready-made food (Jabs & Devine, 2006).

Women who did not perceived time as a barrier tend to have healthier eating behaviors (Williams et al., 2012). Williams et al. (2010) found that women from lower SES who did not consider time a barrier to healthy eating did eat more fruits and vegetables. A study involving African American women indicated that they know they should eat healthier, but the time demands of housework, child care, and work prevented them from cooking healthier meals (Hargreaves et al., 2002). Time pressures were found to be related to a lack of time to cook dinner, and infrequent shared family meals (Lindsay, Sussner, Greaney, & Peterson, 2009). For this reason, women sometimes ate out of the home (Hargreaves et al., 2002). This lack of time was mentioned by women who worked both at home as well as outside the home (Greaney et al., 2012; Lindsay et al., 2009). A group of Australian women indicated that the lack of time to cook was a reason to eat takeaway or fast food (Inglis et al., 2005). For instance, one women said, "Just being busy with the kids and the lifestyle, I just don't have time to prepare meals as I would if I wasn't so busy. It's often—when you're running around it's easier just to buy takeaway or come home and just make something up quickly instead of taking the time to prepare" (Inglis et al., 2005, p. 339)**.**

Even for normal weight women, time impeded the setting or the starting of healthy habits and influenced how the women used food. These comments were primarily made by women who worked and who explained that they either had little time to eat, or ate while doing other things at the same time (Inglis et al., 2005; Sawkill et al., 2013).

2.4.2.2 Interpersonal level

Social support

Social support consists of "aid and assistance exchanged through social relationships and interpersonal transaction" (Glanz et al., 2008, pp. 191). Lawrence et al. (2011) point out that social support for healthy eating has an impact on the quality of diets for women, independent of the degree of education. In a group of women in treatment to lose weight, social support was found to help overcome possible relapses and mitigate the lack of time to cook healthier (Barberia et al., 2008). Hargreaves et al. (2002) stated that social influences are important in women's diets, and this could make it difficult to maintain and choose healthier food. Evans et al. (2009) indicated that social support accounted for 14% of the variance in the intake of fat for African American women.

Two sources of social support for women have been well documented: family and friends. Ball et al. (2007) found that if women felt more support for eating a healthy diet from family and friends, this would be positively correlated to their fruits intake.

Family

It has been seen that with no other factors such as cost of food present, women who perceived more family support for healthy eating will intake more fruits and vegetables and less fast food (Williams et al., 2012). Evans et al. (2009) found that the stimuli and criticism of family were related to low intakes of fat by women. Another study showed that women from lower SES who felt more family support for eat healthy also ate more fruits and vegetables (Williams et al., 2010)**.** In a year-long intervention focusing on rural women, family support was associated with healthier diets at the end of the twelve months (Yates et al., 2012). Damman and

Smith (2009) showed that in women from lower SESs, family influenced the women's food patterns by providing food and also transportation to stores. In addition, some women overlooked their needs, placing their family's needs above their own. As Smith-Dijulio et al. (2010) found in their study, some women said that their family came first and that their own identity was based on their family.

Education can also influence the level of social support. For example, a group of women with lower educational levels indicated having poor social support from their family for following a healthy diet. Family members can have important influences on what food women select for her family and for herself. Some women stated that they gave up trying to change bad eating habits in their family and also adopted unhealthy diets themselves (Lawrence et al., 2009).

Husbands and children are very important influences on women's diet within the family. Ball et al. (2007) found that women who were married or living with a partner had higher intakes of vegetables. Smith-Dijulio et al. (2010) pointed out that women with more support from their husband felt more independent in relation to their behaviors. However, partners were also seen as barriers to healthier eating. For instance, one woman stated, "My partner refuses to compromise on taste, like I'm trying to make something low-fat, it's just like it's not as good as the real stuff, it's garbage and just refuses to eat it" (Inglis et al., 2005, p. 338)**.**

Barker et al. (2008) showed that women who had more children at home exhibited less food involvement. In a later study, however, Barker et al. (2009) found that having children at home was not related to quality of diet. Greaney et al. (2012) pointed out another way in which children influenced eating behavior in Latina mothers: the women usually ate what their children left on their plates. Women from middle and higher SESs mentioned that they cooked what their children preferred (Inglis et al., 2005).

Friends

William et al. (2012) found that women who felt more support from friends to eat healthy tended to also eat more fruits and vegetables. Similar findings were also indicated in a previous study with women from lower SESs who wanted to lose weight: they tended to eat more fruit than those women without their friends' support (Williams et al., 2010). Evans et al. (2009) found that friends' stimuli and criticism were not related to low fat intake**.** Lindsay et al. (2009) pointed out that immigrant women had less support from friends and that this was one of the reasons it was difficult for these women to prepare healthy meals.

It appears that bad eating behaviors, too, are related to the support of friends. In fact, friends have been seen as barriers to healthy eating for women (Inglis et al., 2005). Clendenen, Herman, and Polivy (1994) indicated that young women eat more calories with friends than with strangers. Inglis et al. (2005) indicated that women in their study ate once or twice a week with their friends and that the kinds of food and the amount that they ate with them were very different than those that they ate at home.

2.4.2.3 Organizational level

Workplace and working conditions

Most people who work spend 60% of their waking time at their workplace, and for this reason some eating behaviors can be influenced there (Pridgeon & Whitehead, 2013). Studies have shown that job conditions can be related to one's quality of diet (Devine et al., 2006). It has been shown that fruit, vegetable, and fat intake can be positively changed if there are internal policies to increase accessibility to healthy food in the workplace (Engbers, van Poppel, Chin A

Paw, & van Mechelen, 2005). Even so, workplaces have also been seen as a barrier to healthy eating due to long hours worked, lack of acceptable foods, distance to places to eat, and a "culture that rewards working though breaks" (Pridgeon & Whitehead, 2013, p. 86). In fact, few studies have been conducted on the influences of work and workplace among women. Most of the studies have been conducted with all employees without differentiation by gender.

Pridgeon & Whitehead (2013) found that the foods offered in the workplace were very high in calories. Participants in this study stated that the lack of facilities in which to eat, such as a dining room, causes poor eating behaviors. Some women also stated that they chose less healthy foods because of the lack of affordable healthy food, and because healthy food tends not to attract their attention (Pridgeon & Whitehead, 2013).

Distance to healthy foods can present an issue. Thornton, Lamb, & Ball (2013) suggest that fruit and vegetable intake in women can be positively influenced if these products are available within 0.8 km near to their work. If these foods are more than 2 km away from the women's workplace, only fruit maintains a positive influence.

In a sample of employed parents, mothers indicated that they use several strategies to manage their busy schedule and their meals. For example, mother said that they often have to eat in their cars or miss lunch due to their work. In addition, mothers expressed that during the workday, their meals were restricted to those quick and easy to prepare. Mothers and fathers mentioned the lack of access to healthy food at work or near to work as an influence on their eating behaviors. Long working hours or nonstandard hours causes mothers to eat out of home and miss breakfast (Devine et al., 2009).

2.4.2.4 Community level

Culture and sociocultural norms

Culture has been defined as "the knowledge, traditions, beliefs, values, and behavioral patterns that are developed, learned, shared, and transmitted by members of a group" (Contento, 2011, p. 33). Culture can influence food preferences, attitudes toward food, the kind of food that people buy and eat, their methods of cooking, and the places they decide to eat. Cultural rules indicate what kind of food is acceptable to eat and what kind of food is to be eaten at various special occasions, like holidays (Contento, 2011). Women also have indicated that culture gives meaning to their food (Hernandez-Hons & Woolley, 2012). One study suggested that it cultural influences on one's own context is actually easier to recognize when traveling to other countries (Lennernäs et al., 1997).

In a group of African Americans, eating healthy often means removing their own culture from their lives (James, 2004). Respondents also mentioned that the so-called "Food Guide Pyramid" does not accurately represent what they really eat. "Our food and our music are two things that we have to pass on to our children, and nobody is going to take them away from us," mentioned one participant (James, 2004, p. 358). Similar findings were found from a literature review about how people interpret "the healthy diet" (Bisogni, Jastran, Seligson, & Thompson, 2012). In James's (2004) study, African American participants mentioned that they eat the way that they do because it makes them feel closer to their culture. In addition, for women who are trying to lose weight, their culture is viewed as a barrier to reaching this goal (Blixen, Singh, Xu, & Thacker, 2006).

In another study on immigrant women, it was mentioned that women preferred to eat in ethnic restaurants where they can find their traditional foods**.** For instance, one woman shared:

"We go to Dominican restaurants to eat what we can cook in the house but this happens because I do not feel like cooking, so we go out to eat" (Lindsay et al., 2009, p. 86).

Availability and access to food

The availability of food is an important influence on what kinds of food are in women's homes and what women eat. Lack of fresh fruits and vegetables and other healthy food was mentioned by Latina women in low-income neighborhoods (Lindsay et al., 2009). Greaney et al. (2012) stated that the availability of fresh food and meats presented an obstacle to healthy eating for a group of Latino immigrants. But Latino immigrants also mentioned, positively, that there is a high availability of frozen food at low prices. Williams et al. (2010) found that women from low SESs who perceived a higher availability of healthy food ate more fruits and vegetables. Inglis et al. (2005) reported that a woman said that there were several fast food outlets in her neighborhood, which could facilitate the purchase of unhealthy food. This last point was also indicated by women in Lindsay et al. (2009), in which women mentioned that fast food restaurants were cheaper and their kids enjoyed eating at these places.

Accessibility to food is also related to how women are eating. Lindsay et al. (2009) pointed out that proximity and accessibility to stores selling food influenced Latina women's food choices. In this study, women mentioned that having a car as a way of accessing cheaper places to buy healthy food. As one woman observed, "I would like to eat more meat because, in my country, we eat more meat, but here it is very expensive. If we had a car, it would be different because we would be able to go to more inexpensive places" (p. 85). Also, women mentioned that if they bought food only at mini-markets near their homes, the amount of food they could buy was then limited. Inglis et al. (2005) found that only a few women mentioned

having problems accessing healthy food. But some women did mention that transportation to markets was a problem.

2.4.2.5 Social structure, policy, and system

Mass media

Mass media has the ability to influence health behavior either directly or indirectly. Media is able to inform, model, motivate, and guide behaviors (Bandura, 2002), and is thus useful as a means by which to promote healthy eating (McKinley, 2008). At the same time, mass media also has been extensively used to promote unhealthy foods, such as those with high fat content (Contento, 2011). Mass media can have an influence on the collective knowledge and awareness of certain situations in which the populations are living (Shah, Cho, Eveland, & Kwak, 2005).

Among the mass media, television has been demonstrated to exert an influence on preferences and diet. For instance, Harris & Bargh (2009) showed that prior exposure to television predicted diet and the associated preferences for unhealthy food in college students. In addition, in a previous study on Chilean women, the authors showed that the mass media, especially television messages using famous people, does indeed influence what women choose to buy and eat (Galvez et al., 2015). Along this line, O'Key & Hugh-Jones (2010) indicated that some women find messages from media confounding at times, while expressing some skepticism about what the media say about eating behavior. Special attention has been placed on the effect of television on children's diets, particularly because they learn from what is observed there (Bandura, 2009). Horgen, Choate, and Brownell (2001) found that children can understand from media that the tasty and rewarding foods are also those that are less healthy. Similarly, Powell,

Szczpka, Chaloupka, & Braunschweig (2007) indicated that relatively unhealthy foods make up most (98%) of the food advertisements found on television.

Other studies on the influence of the mass media on eating behaviors have been conducted on younger people and, specifically, on the relation of the media to body image or to eating disorders (Chang et al., 2013; Harrison, 2000). It has been shown that adolescents present more eating disorders when exposed to television and magazines in which the body image is part of the content (Calado, Lameiras, Sepulveda, Rodriguez, & Carrera, 2010). Lopez-Guimera, Levine, Sanchez-carracedo, & Fauquet (2010) state that pressure to be thin, from the mass media, is a risk factor for body satisfaction issues and eating disorders in adolescent girls and young women. Similar results have been found by Farley (2011).

The mass media has also been used to promote healthy eating behaviors. Social marketing has been used to create campaigns or interventions that influence a population's behaviors (Kazbare, van Trijp, & Eskildsen, 2010). These social marketing campaigns are oriented to different groups of populations and can be focused on promoting different eating habits (Carins & Rundle-Thiele, 2013). One example of this campaign is the "5 a Day" campaign that promotes the intake of fruits and vegetables in the United States (Centers for Disease Control and Prevention, 2005) and at an international level (Asociacion para la Promocion del Consumo de Frutas y Hortalizas, 2011). According to a literature review done by Carins & Rundle-Thiele (2013), social marketing could have the ability to change eating behaviors.

Price of food

Cost or price of food is frequently mentioned as a barrier to healthy eating. People frequently mentioned that healthy food is more expensive than unhealthy food. For example, studying Latino immigrants in the US, Greaney et al. (2012) noted comments such as, "We buy

the cheapest food, which isn't always healthy" (p. 450) to exemplify this situation. Lindsay et al. (2009) found that one woman mentioned, "Sometimes, not always, but some months, you have to restrain yourself to just food, nothing else but food, and you can't buy such and such cereal or a lot of fruit because fruits are expensive" (p.85). Women who did not perceive cost as a barrier indeed tended to eat more fruit and vegetables (Williams et al., 2012).

In women from lower SES, cost was broadly considered at the moment of buying food, especially healthy food (Inglis et al., 2005). Women from lower SES also considered the price of food more than women from middle and higher SES. A woman from a lower SES said, "Yes I'm afraid I do consider the cost of things; although sometimes I will just buy quality meat, fruits and vegetables and leave the no brand names for say breakfast cereals" (Inglis et al., 2005, p. 339), an example of a strategy to overcome the price of some quality food. Similar strategies were found by Dressler and Smith (2013a). Inglis et al. (2005) indicated that women mentioned fruit and vegetables as expensive foods. This also was mentioned by women by Lindsay et al. (2009). Women from lower SESs who were overweight or obese also mentioned cost as a factor influencing their eating behavior more frequently than lean or normal weight women from the same SES. Although for some obese women, some food were not forgone no matter the price. For example, a women indicated, "There's maybe a dozen items that it doesn't matter if it's on sale or not that I will get just because of the taste for it" (Dressler & Smith, 2013a, p. 148).

In contrast, unhealthy food was mentioned as being less expensive. Researchers quoted a woman to explain that sometimes she bought fast food because it was cheaper and provided enough for all her family: "You can get 24 chicken wings, fries, and a 2 liter for 14 dollars, and it's me, my three kids, my fiancé, and if my other kids is with me, it's like 4 or 5 of us, and it feeds all of us, the price is right, the food is good" (Dressler & Smith, 2013a, p. 148).

Alternatively, some women explained that they preferred to cook at home because that was cheaper (Dressler & Smith, 2013b).

Women also pointed out that it was difficult for them to have to choose between food and others needs for their family. Though for women who were mothers, food was something very important. These women tried to buy healthy food; they looked for sales, cost-cutting stores, discount coupons, and other specific places to buy food more cheaply (Lindsay et al., 2009).

Food policies

Food policies have a relationship with most of the previous variables mentioned at this level of the SEM, as well as at other levels.

Food policies are defined as actions aimed at improving the diet of the population, and that are created by government at different levels (Hawkes et al., 2015). To the extent that problems with unhealthy diets increase, and thus obesity and associated problems, the policies to promote healthy eating also increase (Barnhill, King, Kass, & Faden, 2014). These policies that focus on improving eating behaviors are linked with improving the availability, affordability, and acceptability of healthy diets, and with reducing the availability, affordability and acceptability of unhealthy diets (Hawkes, Jewell, & Allen, 2013). A study on policies related to food, health, and nutrition, among countries of the OECD, indicated that the policies were mainly related to educational campaigns that promoted healthy eating, consumption of fruits and vegetables, and nutrition labeling (Fulponi, 2009). Another study in the European Union found that the largest number of food and nutrition policies had to do with promoting informed food choices through public campaigns and education in schools (Capacci et al., 2012). The policies related with food

market control were scarce, except for those aimed at the supply of food in schools (Capacci et al., 2012).

According to Hawkes et al. (2015), there are four mechanisms by which food policies can work: a) providing environments where learning about healthier options is permitted b) overcoming barriers so that the healthier choices can be made or expressed in these environments c) encouraging people to reevaluate existing unhealthy choices, when confronted with these, in buying food, and d) stimulating the response of food systems. Some policies that have had some impact on eating behaviors: the control of time and the kind of food that can be advertised on television (Capacci et al., 2012; OMS, 2013), the creation of nutritional guidelines based on food (Hawkes, Jewell, & Allen, 2013), educational campaigns using mass media (Capacci et al., 2012), the regulation of nutritional labels (Capacci et al., 2012), the use of subsidies or taxes to control the prices of food (Capacci et al., 2012; OMS, 2013), zoning and land use regulations (Nixon et al., 2015; Public Health Advocacy Institute, 2012), and the control of the food system (Swinburn et al., 2013), among others.

2.5 Socioeconomic Level, Nutritional Status, and Eating Behaviors

Inequality in SES has been associated with inequality in nutrition and, subsequently, in health (Ball et al., 2007). Low SES individuals tend to be more overweight and obese than those from other SES (Truong & Sturm, 2005). Some explanations for these inequalities have included behavioral factors, such as diet, and psychological characteristics (Lynch, Kaplan, & Salonen, 1997). People of lower SES have worse diets (related with quality of food) than their wealthier counterparts (Inglis et al., 2005). For example, people in the upper and middle classes tend to eat more fruits and vegetables (Hupkens, Knibbe, & Drop, 2000; Irala-Estévez et al., 2000). The

diets of people with a lower SES tended to include more fat and less fiber (Johansson, Thelle, Solvoll, Bjorneboe, & Drevon, 1999). In addition, people from low SES could also have higher rates of depression (Lynch et al., 1997).

In the study of women's health, socioeconomic inequalities is one framework for study that cannot be omitted (Moss, 2002). McLaren (2007) showed that low SES women in industrialized countries are more likely to be overweight or obese than their counterpart. This difference in obesity rates could be attributed to the different diets those women from different SES have. Hupken et al. (2000) found that women from higher SES had low intakes of meats and milk and their derived foods, as well as fats, but had high intakes of cheese, in comparison with women from a lower SES. Also, women from a higher SES ate more fiber from brown bread and grain than did those from a lower SES; women from middle and higher SES also ate fewer chips, savories, and sweets. Inglis et al. (2005) found that women from lower SES bought takeaway food from fast food restaurants more frequently than did women from middle and upper SES.

Ball et al. (2007) confirmed that the intake of fruits and vegetables was different depending on the SES of women (low SES measurement derived from low level of education). They also found that women from lower social classes gave less consideration to factors related to health when choosing food. The same was found by Johansson et al. (1999). Other variables, like nutrition knowledge and motivation to eat healthy, are different based on a person's social class (Ball et al., 2007).

When looking at SES, income is a big factor. Women from a lower SES have lower incomes, and for this reason they tend to have priorities more pressing than their choices about

food. The scarcity of disposable income influences their capacity to select and buy certain kinds of food, due to the price (Barker, Lawrence, Woadden, et al., 2008).

Women varied when making food choices in the interests of their families' health, according to their SES. For instance, middle class women mentioned their family's health as the most important reason for buying certain food items. Lower class women indicated that the price of the food item and the preferences of their partners and children were more important shopping considerations than health factors (DeVault, 1991; Hupkens et al., 2000; Wilson, 1989).

2.6 Qualitative Methods in the Study of Eating Behaviors

Researchers that study diet and nutrition typically use quantitative methods (Harris et al., 2009). However, this field is changing, and qualitative methods are being valued for the kind of information that they can offer. In the field of nutrition, it is well understood that food and eating are more important than simply means for meeting a biological need (Chamberlain, 2004). With this perspective, there are many factors and relationships that are difficult to understand just with the use of scales or questionnaires (Swift & Tischler, 2010). According to Swift & Tischler (2010) "Dietitians work at the heart of this complexity [what food and the intake means]. They are required to bridge the gap between logical, unambiguous scientific data and the complicated, multiple functions that food has in their clients' lives" (p. 560). Therefore, qualitative research has been considered a key element of health care, since several topics in health are better understood from a constructivist point of view, as in the case of behaviors (Padgett, 2012). According to Bisogni et al. (2012), qualitative methods have the potential to give more understanding of "social and behavioral aspects" of eating behaviors (p. 282). It allows researchers to obtain emotions and perspectives, beliefs, and values from participants to help

them understand their behaviors and how they create their experiences of life around those behaviors (Morse, 2012). In summary, qualitative methods have the ability to arrive at understanding how and why behaviors are performed (Swift & Tischler, 2010).

Among qualitative approaches, the Grounded Theory has been widely used by researchers of many different fields. According to Charmaz (2006), Grounded Theory consists of "systematic, yet flexible guidelines for collecting and analyzing qualitative data to construct a theory 'grounded' in their data" (p. 1). Grounded Theory represents more than just a description of what is happening with a phenomenon, it is used to "generate or discover a theory" (Creswell, 2013, p.83). This approach is very useful when no other theories are able to explain the phenomenon (Creswell, 2013). Studies using Grounded Theory have already been conducted to investigate eating behaviors. Johnson, Sharkey, Dean, McIntosh, & Kubena (2011) conducted a study using this approach to understand a mother's food choice. The authors state the main advantage of this approach is that it leads to an understanding of what is happening with the participants, in context. Another study used Grounded Theory to understand how women maintain healthy eating habits after completing a weight management program (Zunker & Ivankova, 2011). The authors stated that they selected this approach because "it provides a systematic approach for building useful theories by applying analytic tools to organize raw data" (Zunker & Ivankova, 2011, p. 862)

In relation to the most-used qualitative methods on the study of eating behaviors are, in-depth interviews, semi- structured interviews and focus groups. Among these methods, semi-structured interviews are widely used. For example, semi-structured interviews have been used in children to understand meal and snack intake in adolescents (Husby, Heitmann, & O'Doherty

Jensen, 2009); to understand the role of family in food intake (Lachal et al., 2012); or the determinants of women's eating patterns (Inglis et al., 2005; Johnson, Sharkey, & Dean, 2011).

2.7 Visual Methods and Photo-elicitation

Visual methods are defined as the use of any kind of visual materials during a research study, such as videos, pictures, draws and images. These materials can be produced by researchers or participants, or can consists of previously existing material (Banks, 2001). A recent review conducted by Pain (2012) indicates that researchers use visual methods for two reasons: to enhance data collection and presentation, and to improve the relationship between the participant and researcher. Keller et al. (2007), state that visual methods could be useful in the study of eating behaviors, arguing that visual methods can give more information about portion sizes, food purchase and preparation patterns.

Among the most used visual methods on nutrition field is Photo-elicitation. This method is considered to be a participatory action research method. It is defined as "a photograph into the research interview," in order to better understand the participant's world (Lorenz & Kolb, 2009). This method considers that pictures are records of reality, and can be a source of information about a research question.

In the last years, photo-elicitation has being used to study eating behaviors. Most studies use women as participants (Johnson, Sharkey, & Dean, 2011; Johnson, Sharkey, Dean, et al., 2011; Johnson et al., 2010; Lachal et al., 2012), while only one article included the study of men (Castellanos et al., 2013). It appears that photo-elicitation is a technique used mainly in the understanding of food choice and diet. For example, Johnson, Sharkey, & Dean (2011) studied the food choices in Mexican mothers, finding that it was influenced mainly by their children.

This same group of researchers studied the influences of matrilineal family members on families' food choice (Johnson et al., 2010). Lachal et al. (2012) used photo-elicitation in a group of adolescents to understand the role of food among obese adolescents' family. In addition, the use of pictures as a source of information has been used to complement the study of eating behavior, arguing that these methods can give information about behaviors that cannot be obtained with other traditional methods such as 24-hour recall or food frequency (Husby et al., 2009). Recently, photo-elicitation has been used as a form of evaluation in a hospital setting to know the degree of patient's satisfaction with the hospital meals (Justesen, Mikkelsen, & Gyimóthy, 2014).

Photo-elicitation presents several advantages, contributing to the conventional qualitative methods. First, depending on how participants explain the pictures, the researcher can obtain a broad range of insights about a social phenomenon than otherwise might be accessible. Talking about pictures "can prompt talk about different things, in different ways" (Rose, 2012, p.305). Other authors point out that using visual methods such as photo-elicitation use spurs other kinds of participant knowledge, stimulated by pictures. Indeed, according to Johnson et al. (2010), this method reveals information that is difficult to obtain from traditional methods. For Lachal et al. (2012), photo-elicitation can "facilitate verbalization" (p.1100).

Second, this method allows researchers to obtain information about everyday events related with the theme throughout the participants' lives, not only what is recently done. Third, it empowers participants. They have the most relevant role in the research because they take the pictures, and they are the "expert" (Rose, 2012, p.306), in many ways, during the interviews. Fourth, this method does not require that participants in the research have higher educational levels. Also, it is considered a clever method to engage people in research (Rose, 2012). Finally,

it has been seen that photo-elicitation increases rapport with participants and encourages their mutual investment in the project (Johnson et al., 2010).

2.8 Mixed Methods Approach and Eating Behaviors

Previous studies using mixed method have been used to analyze eating behaviors. For example, using self-administered questionnaires and semi-structured interviews with the purpose of triangulation, Sui, Turnbull, & Dodd (2013) studied the perceptions of overweight and obese women, regarding health changes during pregnancy. The authors stated that using mixed method provided "stronger evidence of the validity of our findings" (p. 1886). Another study using mixed method was conducted with college students in order to understand the beliefs and behaviors associated with the food environment that influenced the food choices (Campbell-Arvai, 2015). Isselmann DiSantis, Hillier, Holaday, & Kumanyika (2016) researched the decision of where to buy food, in African-American women. The authors stated that using a combination of the mapping system and semi-structured interviews helped them to "acquire depth in understanding why shopping occurs where it does" (p. 138). Most of these studies used mixed method to complement the information gathered from other methods, or the methods were combined to triangulate the data.

In Latin American, there are few mixed method studies in health research. In fact, in research conducted in the nursing field among Latin American countries, it was found that 80.8% of the studies used a quantitative approach, 17.3% used a qualitative approach, and just 1.3% used a MM approach (Alarcon & Astudillo, 2007). Among the few studies using mixed method in Latin America, we found just one focused on eating behaviors. This study evaluated a nutritional program from an integral perspective, combining questionnaires, anthropometric data, and

observations (Scruzzi, Cebreiro, Pou, & Rodríguez, 2014). But, in this research it is not clear where the mixture of the data was produced. No research using mixed method on eating behaviors has so far been conducted in Chile.

This chapter covered the most important areas to better understand this research. The context of Chile was presented at the beginning. Subsequently, the eating behaviors and their relevance to people's health is highlighted. Eating behaviors are important to women's health because of their connection to NCDs. The factors that influence eating behaviors in women are distributed at the different levels of the SEM. The SES has been reviewed in a separated section due to its important in the focus of this research and its influences on women's nutritional status and diet. It is established that qualitative method, including photo-elicitation could help to obtain deeper information about eating behaviors in an understudied group in Chile: women of low socioeconomic level. Information about what is influencing eating behaviors is important because health planners and health care providers can create programs and other interventions that focus on these aspects. However, information about determinants of eating behaviors in women, as well as in others group, is scarce in some countries, such as Chile. This way this study will contribute to this gap adding information about low SES women's diet, but also about how this diet is influencing by different factors according with the nutritional status that they have, an issue that has not been studied in a deeper way.

CHAPTER 3

METHODOLOGY

3.1 Study Design

Considering the exploratory nature of this study and the need to gain an in-depth understanding of the Chilean women's eating behaviors, this study employed, as a base, a qualitative approach, which involved semi-structured interviews with photo-elicitation (Krathwohl, 2009a). As this study intends to explain how women's eating behaviors are founded, a Grounded Theory approach was used (Johnson, Sharkey, Dean, et al., 2011). According to Charmaz (2014), his approach can transform qualitative data into elaborate theories – theories that originate from the data.

Elements from the quantitative and then, the mixed method approach were incorporated to answer the aims of this research – which include exploring the variables that influence the eating behaviors of women from low SES backgrounds in Santiago, Chile – and comparing those variables among women who are normal weight, overweight, and obese. From a quantitative standpoint, a survey was developed to obtain demographics, socioeconomic status, health data, and physical activity data. For the mixed method approach, there were two main purposes: First, quantitative data, specifically BMI, was used to inform the next work with qualitative data, dividing the whole sample into three groups, which is known as development purpose (Greene, 2007). Second, a purpose of complementarity was used, looking for a broader, deeper, and more comprehensive understanding of the influences of eating behaviors. In this way, quantitative data was complemented with qualitative data (Greene, 2007).

3.2 Sampling Methods, Participants, and Site

A purposive sampling method was used in this study. This method allowed for a wide selection of participants, which supplied the study with a sufficient variety of participant perspectives and information (Krathwohl, 2009b). The researcher selected the most productive sample of women that allowed for the research questions to be answered (Marshall, 1996). Marshall (1996) states that age, socioeconomic status, and gender could be important variables to consider in this sampling method, variables that were incorporated as inclusion criteria.

The inclusion criteria were: being women aged 25 to 50 years old, having at least one child less than 12 years of age, living with a partner, and living in a low SES urban neighborhood in Santiago, as defined by the Social Priority Index [Indice de Prioridad Social] (Secretaría Regional Ministerial de Desarrollo Social- Gobierno de Chile, 2014). This index uses five categories, based on variables such as income and the education level of people in each neighborhood. These variables determine the level of vulnerability, which ranges from "high priority" to "no priority". The current research was conducted in health care centers and community organizations from seven neighborhoods that range from high priority to high middle priority in the index. Participants were invited to participate in a face-to-face pre-screening meeting in waiting rooms at public health care centers. In addition, snowball sampling was used in community organizations in which a community leader was contacted and asked to invite other women (Emerson, 2015). More than 50 women who met the inclusion criteria were invited to participate in the study. Excluded from the study were those women who could not complete the interview questions due to problems like mental health issues (n=1), or who could not complete the photo-elicitation assignment (n=5). Thirteen women either could not finish the study or they decided not to continue participating for personal reasons. The principal researcher

was in charge of doing the initial evaluation of the inclusion criteria at the moment of recruitment. A total of 31 women completed the study.

3.3 Theoretical Framework

Due to the behavioral basis of this research, two Health Behavior Theories were used in framing the study: The Social-Ecological Model (SEM) and the Social Cognitive Theory (SCT). Both have been used as theoretical frameworks in previous studies to guide interventions related to nutrition (Anderson, Winett, & Wojcik, 2007; Dresler-Hawke & Veer, 2006). In addition, these theories can better explain how eating behaviors, which are considered a complex behavior, can be influenced by different levels of factors (Shumaker, Ockene, & Riekert, 2009).

These theories guided two stages in this study. First, they guided the interview questions (see Appendix A). The questions built for this study inquired into how the constructs from the theories influenced the eating behaviors of each woman. Therefore, questions were developed to address the individual, interpersonal, organizational, community, and policy levels. Second, these theories guided a section of the data discussion. For this discussion, the collected data were organized according to the level of the SEM.

3.4 Data Collection

Semi-structured individual interviews using photo-elicitation (PE) and a guide of questions (Hanna, Jacobs, & Guthrie, 1995; Harper, 2002; Lachal et al., 2012) were conducted from November 2014 to March 2015.

Participants came to an initial meeting in which each of them received a disposable camera with a capacity of 27 pictures. Participants were trained to properly use the cameras, and were instructed on the ethics of taking pictures, such as how to obtain a signed consent form for

photographs of children. After this training process, participants were asked to take approximately 20 pictures of their food world, and to use the remaining pictures to capture images of personal interest (Johnson et al., 2010). They were encouraged to take pictures not only of meals, but also of any important aspects of their lives they considered related to food or nutrition (e.g., food vendors, social events, and culinary preparation) (Rose, 2012). Participants were asked to take pictures over seven consecutive days. The researcher conducted reminder calls during the week of picture taking. After this period, participants returned the camera, and two copies of the pictures were developed, one for the participants and one for the researcher.

At the beginning of the interviews, participants were asked to share their experiences and their overall opinion of their PE assignment (Johnson, Sharkey, Dean, et al., 2011). Next, they were asked to review their pictures and select five to seven that they most wanted to share or that they thought were particularly interesting. Participants titled the selected photos (Johnson, Sharkey, & Dean, 2011), and the researcher used the Shaffer's (1983) SHOWeD technique to initiate the discussion. The SHOWeD technique has been used in other PE studies on eating behaviors (Johnson, Sharkey, & Dean, 2011; Johnson et al., 2010). This technique poses questions such as, "What do you **S**ee in this picture?"; "What is **H**appening in this picture?"; "How does this relate to **O**ur lives?"; "**W**hy does this problem, concern, or strength **e**xist?"; and, "What can we **D**o about it?". Additional questions previously used in PE research were also posed, such as, "When was this picture taken?"; "Why did you select this photograph?"; "Is this a typical activity/food for your family?"; and, "How does this picture make you feel?" (Johnson, Sharkey, & Dean, 2011). The researcher also selected additional five to seven pictures from those the participants did not select, and followed the same SHOWeD procedure for these photos.

The researcher asked the questions from the interview guide (appendix A) in a way that made them applicable to the pictures, to clarify or obtain more information about the points mentioned by the participants.

A Chilean researcher (Patricia Galvez) conducted all interviews in Spanish. Participants selected the time and place of the interviews. Most of the interviews took place at participants' homes and lasted between 30 and 90 minutes. Four participants did not agree to be recorded; the researcher took notes instead of audio recording the interview.

The data saturation was reached at interview 22; at this point, no new topics appeared in the interviews, or when a new topic did appear it did not add any new information to the phenomenon studied (Mason, 2010).

In addition to PE interviews, data on demographics, health status, and eating behaviors were collected for each participant. The researcher measured the weight and height of all participants, following a standardized protocol (Martinez & Ortiz, 2013; World Health Organization, 2016a). To determine body weight, a Seca® portable scale model 803, which has an accuracy of 0.1 kg and a maximum capacity of 150 kg was used; the height was measured using a Seca® portable stadiometer model 214, with an accuracy of 0.1 m and with a maximum height of 210 cm. The Department of Nutrition at the University of Chile lent these instruments to the researcher.

Demographic data were collected using a questionnaire (Appendix B). This questionnaire included questions that aimed to obtain data such as the participant's age, educational attainment at highest completed level (De Vriendt et al., 2009; Williams et al., 2010), occupation (current or last occupation [Wardle & Steptoe, 2003]), and marital status (married, single, widowed/divorced [Greaney et al., 2012]). Number and age of children were also collected. The

number of people in the participant's household was included. In addition, questions were asked about the presence of chronic or acute diseases, and the kind of health insurance possessed (public or private). The information about demographic and health status helped to characterize the study participants. This questionnaire was administered during the second meeting with the women, when they returned the cameras.

Eating habits were collected through two main methods: a food-frequency questionnaire, and pictures from the PE assignment. Generally, the FFQ consisted of a list of food, or groups of foods, and the times per week, month, year, or other duration in which each food is consumed (University of Colorado Denver, 2016). For the purpose of this study, a FFQ was used that measured the food intake over the past month. A validated Spanish version of a FFQ was used (Rodríguez, Ballart, Pastor, Jordà, & Val, 2008). This was adapted to the Chilean context, using Dietary Guidelines for the Chilean Population (Instituto de Nutricion y Tecnologia de los Alimentos, Universidad de Chile, & Programa 5 al dia, 2013) (Appendix C). For each food on the list, participants were asked about the frequency of consumption and the amount consumed over the past month. To improve the information received about the amount of food or liquid consumed, a photographic atlas of Chilean food and preparation was used (Cerda, Barrera, Arenas, Bascunan, & Jimenez, 2010). This atlas contains pictures of amounts of food and preparation, arranged by standardized weights. It was used in the Chilean 2010-2011 National Food Consumption Survey. This questionnaire was administered during the second meeting. We collected the food intake information from 22 participants.

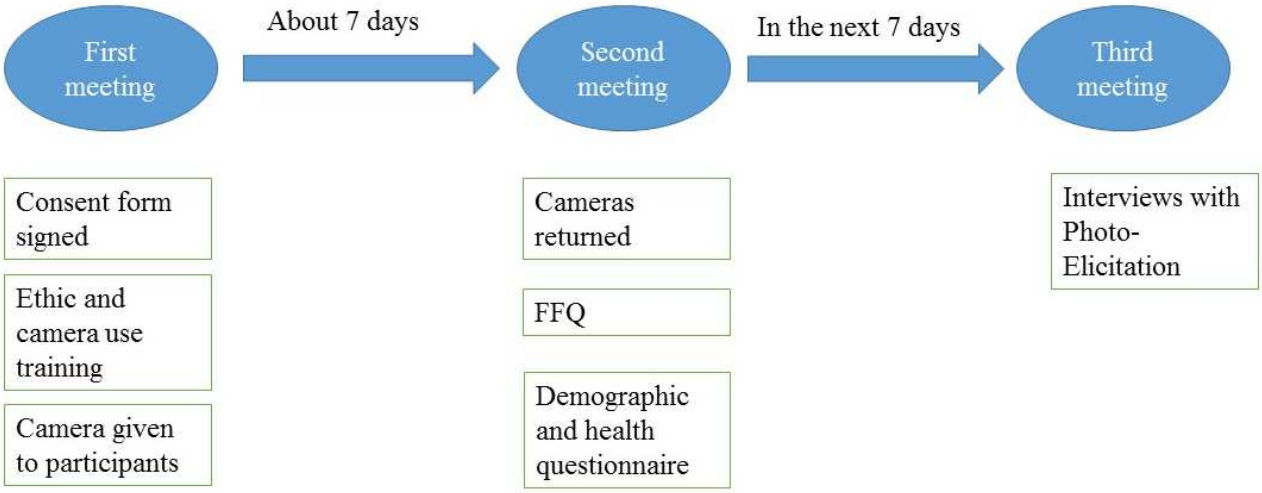
Pictures taken by participants as part of the photo-elicitation assignment were used as a source of information regarding eating behavior. The researcher reviewed all pictures taken by

participants prior to interviewing them in order to identify those that could represent an eating habit.

The information about the eating behaviors (from the FFQ and pictures) was reviewed before conducting the interviews. In this revision, notes were taken (for example, about the kinds of meals during the day, times of meals, and certain kinds of food), to help with the interviews.

The data collection was conducted between November 2014 and March 2015. A schema of how the data were collected is presented in Figure 3.1.

Figure 3.1. Organization of the data collection



Prior to recruitment and data collection, clearance was obtained from the Institutional Review Board at the University of Illinois at Urbana-Champaign and from the University of Chile's Ethics Committee. Informed consent was obtained from all participants prior to their initiation in the study.

3.5 Data Analysis

The data analysis is presented in reference to the aims of this research. A scheme of the data analysis is presented in Figure 3.2.

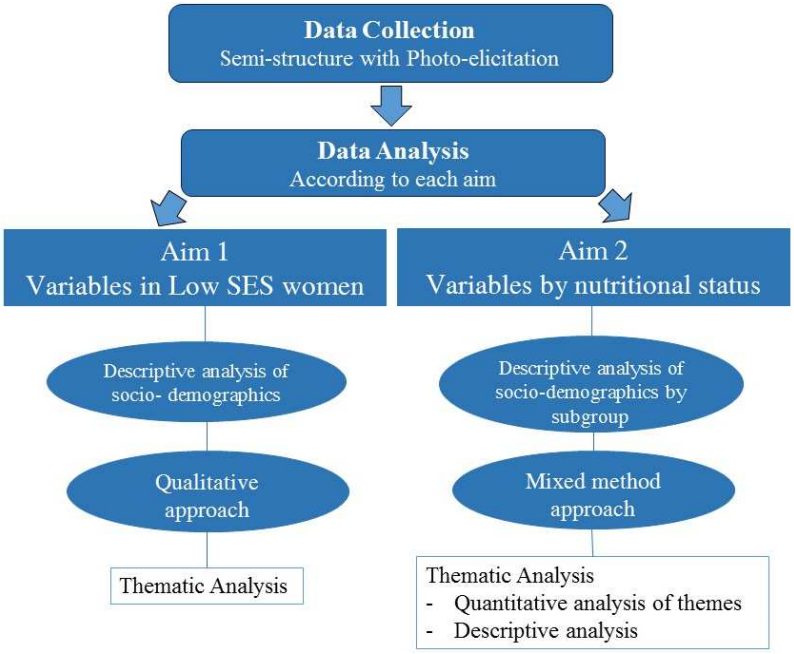


Figure 3.2. Summary of data analysis

3.5.1 Aim 1. To explore the variables that influence the eating behaviors of women from low SES in Santiago, Chile

3.5.1.1 Descriptive Statistic: Analysis of Demographics, Health, and Food Intake Variables

Demographic and health status information was analyzed using descriptive statistics. Means, standard deviation, and percentages were used to describe these variables.

The data obtained by the FFQ was analyzed with the Food Processor version 10.13.1 (ESHA research, n.d.), with the goal of obtaining the intake of calories and nutrients of each participant. Mean and SD of calories and nutrients were calculated. Percentages in relation to the

nutritional recommendation (U.S. Department of Agriculture, 2016) for women (energy and macronutrients) were also calculated.

The SPSS software, version 20.0, was used to obtain the descriptive statistics of the demographics, health, and calorie and macronutrient intakes variables. The results from this analysis can be found in Table 4.2.

3.5.1.2 Thematic Analysis: Analysis of Variables that Influenced Eating Behaviors

All interviews were transcribed verbatim. The field notes from the participants' interviews that were not audiotaped were entered into a Word document and were treated as verbatim transcribed interviews. A team of researchers (five Chilean nutritionists) analyzed the interviews (each interview was reviewed by three researchers). The research team conducted a thematic analysis following the guidelines proposed by Braun & Clarke (2006). This analysis was conducted to obtain a better understanding of how women built their current eating behaviors; therefore, the information was drawn from the data without preconceptions (inductive analysis) (Braun & Clarke, 2006), following what is indicated by a grounded theory approach (Charmaz, 2014). This thematic analysis was based on the narrative that participants constructed about their pictures (Johnson, Sharkey, & Dean, 2011).

The researchers conducted a preliminary analysis of ten randomly selected interviews to familiarize themselves with the data and to search for initial codes. A descriptive coding method was used, meaning that "in a word or short phrase, the basic topic of a passage of qualitative data" was summarized (Saldaña, 2013, p.88). Subsequently, the team compared codes for agreement, retaining only those codes that the majority of investigators identified and that the entire team unanimously agreed upon after extensive discussion. The lead researcher then created a general codebook containing these initial codes. The general codebook was used in

conjunction with Nvivo 10.0 to revise the 31 interviews. From the codes obtained from these 31 interviews, the lead researcher created categories which were discussed among the rest of the research team. Finally, from these categories emerged the final themes. The final themes represent the perspectives of the majority of participants (75% or more). When discrepancies arose, the research team discussed each case, using the discussion as an opportunity to further refine each theme (Patton, 2002b). The seven main themes and subthemes that resulted from this process are displayed in the results section (Aim 1). Sample interview quotations and photographs provide examples for each theme and subtheme. Because few direct quotations were obtained from the few participants that did not want to be audio taped, most quotations used as examples came from the other 27 interviews. We conducted the analysis with the interviews as they were in the original Spanish, and then native Spanish and English speakers translated the quotations used as the examples, trying to preserve the semantic equivalence across languages (Behling & Law, 2000; Santo, Ribeiro-Ferreira, Alves, Epstein, & Novaes, 2015). Codes for each participant were used to identify the quotation origins.

3.5.2 Aim 2. To compare the influences on eating behaviors of low SES women who are normal weight, overweight, and obese.

To answer the second aim, a mixed methods approach was used. The purposes of using this approach were related to the developmental and complementarity aspects. In regard to the first purpose, it indicates that data from one framework allows for the development of the analysis of another set of data from another framework (Greene, 2007). To do this, participants were first divided into groups according to their nutritional status defined by their BMI: normal weight (BMI mean = 23.7 kg/m^2), overweight (BMI mean = 27.9 kg/m^2), and obese (BMI mean

= 34.2 kg/m^2). This allowed the researcher to conduct the consecutive analysis by group. Second, the complementarity purpose seeks broader, deeper, and more comprehensive social understandings of *a phenomenon*; thus, different kinds of data can be "mixed" to complement each other (Greene, 2007). In this current research, the quantitative analysis of the themes allowed the researcher to complement the qualitative analysis.

3.5.2.1 Descriptive Statistic: Analysis of the Demographics, Health, and Intake Variables by Nutritional Status

We used means and percentages to describe each variable per group. Due to the small sample size, we could not evaluate statistical differences between groups.

3.5.2.2 Thematic Analysis: Analysis of Variables that Influenced Eating Behaviors by Nutritional Status

A comparative analysis by groups was conducted, using the thematic analysis that was performed to answer the first aim. Quantitative and qualitative data were used here. First, a contrast table was constructed, in which each theme found in the first aim was reviewed by nutritional status groups (Miles, Huberman, & Saldaña, 2014). This table included the percentage of participants that mentioned the theme, and the mean of times that each theme was mentioned during the whole interview (called repetition). The intention was to look at the intensity of each theme found in the previous stage, by nutritional status groups. This quantitative information was obtained with the aid of Nvivo software.

Second, a descriptive qualitative analysis of each theme found in the thematic analysis for the first aim was carried out. The goal of conducting this analysis was to look for patterns inside of each theme, by nutritional status groups. A contrast table was built to evaluate the differences

between these patterns by groups (Miles et al., 2014). This contrast table can be observed in Table 4.4.

Third, following the last stages of the thematic analysis suggested by Braun & Clarke (2006), an additional descriptive analysis was conducted by group to identify additional patterns and themes. Seven new themes were identified during this analysis and they are shown in the results section (aim 2). Those themes represented the voice of most of the participants in the corresponding group (at least 75% of the participants in the group). In the case of the obese group, it was considered to be 71% due to the smaller sample size of the group; this value represents n=5. The proportions and the repetitions of each new theme are shown in Table 4.5. Table 4.6 display the information regarding the presence or absence of each new theme in each nutritional status group. Sample interview quotations provide examples for each theme in the result section. The same participant codes were used to answer the first aim, with the difference of added letters: “nw” for normal weight, “ow” for overweight, and “ob” for obese.

3.6 Trustworthiness

As this study is mainly based on qualitative research, the concept of trustworthiness has been considered. While a mixed method analysis was performed that could help with data reliability, this was based on the thematic analysis performed on qualitative interviews.

Trustworthiness has been related to quality and credibility (Patton, 2002a). These concepts attempt to answer the question of how a researcher can demonstrate that her or his results are real and are “worth paying attention to” (Lincoln & Guba, 1985, p. 290). This “real” nature of the findings from qualitative research, most of the time is based on critiques by

traditional researchers. Lincoln and Guba (1985) suggest that trustworthiness has to be assessed based on four criteria: credibility, transferability, dependability, and confirmability.

Credibility. This can be seen as equal to "internal validity" in conventional inquiry. This is related to the concept of "true value"; the degree to which the results from a research represent the reality of the situation under study (Lincoln & Guba, 1985). The current research included prolonged engagement, triangulation of analysts, and peer debriefing. For prolonged engagement, we were in the field enough time to obtain the information to answer the research purposes and to gain some "truth" with the target subjects (Lincoln & Guba, 1985). The main investigator was in the setting for five months and had at least three meetings with the participants during the data collection period, which could have helped to establish rapport with the participants. In addition, the main researcher was involved in the data analysis process for about one year, which allowed her to familiarize herself with the information, and to be able to analyze it in a deeper way, as it was described previously.

With regard to triangulation, which is seen as having some utility based on the idea that "no single method ever adequately solves the problem of rival explanations" (Patton, 2002a, p. 555), analyst triangulation was used. Analyst triangulation refers to the incorporation of different investigators in the collection or analysis of the data (Lincoln & Guba, 1985). In this research, five researchers "independently analyzed the same qualitative data and compared their findings" (Patton, 2002a, p. 560).

The peer debriefing strategy was utilized, which means that the research was exposed to "disinterested peers" to obtain insights, comments, or suggestions that could have been previously forgotten or unknown by the researcher (Lincoln & Guba, 1985). For this study, the main researcher presented the results or sections of the results in several instances. The

researcher exposed the results in the ADL laboratory, which included students with different backgrounds and degrees. Furthermore, the researcher presented results at several conferences to national and international audiences.

***Transferability*.** This is related to external validity, of a conventional approach. In qualitative research, generalizing outcomes to other populations or contexts is very difficult or almost impossible. Researchers who conduct qualitative research can provide a thick description of the setting and participant characteristics that allows other researchers to make the decision on what could be transferred to their own research (Lincoln & Guba, 1985). For this reason, we included a description about participants' demographics, health status, and other variables that allow other researchers to identify who the participants were. In addition, a description of the setting is presented (in the literature review sections). With both of these descriptions, the researcher is trying to give to readers the "thick description" of the sample and also the context.

***Dependability*.** Dependability is related to the reliability from the quantitative approach. It has been proposed that if the actions for credibility are taken, there will be dependability (Lincoln & Guba, 1985).

***Confirmability*.** According to Lincoln and Guba (1985), the strategies used for previous criteria can also increase the confirmability of the findings. In addition, it is suggested that an audit trail be used as a strategy to increase confirmability. The audit trail is related to extensive review of the research, and is similar to a fiscal audit of a company (Lincoln & Guba, 1985). In the current research, this "audit trail" was performed by keeping a strict record of what was done or changed throughout the research process, including revisions from committee members.

CHAPTER 4
RESULTS

The socio-demographic and participants' health characteristics are shown in Table 4.1. Participants were aged 36 ± 6.3 years and had 1 to 5 children. All of them had at least one child less than 12 years old. More than 60% of them had completed high school and were unemployed. Five of these unemployed participants had some sporadic employment related to selling homemade food. Most of the participants had public health insurance, which is provided by the Government (Table 4.1).

Table 4.1 General characteristics of participants (n =31).

Characteristic		Value
Age in years (mean ± DS)		36.2 ± 6.3
Educational attainment (%)	Less than 12th grade	10
	High School	64.5
	Technical	22.6
	College	3.2
Work status (%)	Unemployed	61.3
Monthly household income (US$ per capita) (mean ± DS)		166 ± 124.3
Kind of health insurance (%)	Public	90.3
Presence of NCD (%)	Yes	35.5
Any kind of aerobic exercise (%)	No	74.2
Any kind of resistant exercise (%)	No	96.8

Table 4.1 (Cont.)

Characteristic		Value
Nutritional Status (%)	Normal weight	29
	Overweight	48.4
	Obese	22.6
Caloric intake (cals/day) [1] (n=22)		2293.7 ± 880.3
% of recommendation[2]		127 ± 48.9
Macronutrient intake (n=22)	Carbohydrates (gr/day)[1]	320.3 ± 129.3
	Carbohydrates distribution[3]	56.2 ± 8.5
	Proteins (gr/day)[1]	79.7 ± 29.9
	Protein distribution [3]	14 ± 3.3
	Fat (gr/day)[1]	81.5 ± 38.8
	Fat distribution [3]	31.3± 7

Note: 1. Mean ± DS
2. Source: U.S. Department of Agriculture, 2016
3. Macronutrient distribution range in relation to the caloric intake

Concerning health status, most of the participants (65.5%) did not have any NCD (such as diabetes or hypertension) and were sedentary. Seventy-one percent of the participants were overweight or obese. In addition, 64% had a caloric intake higher than the recommended amount for adult women (1800 calories; (U.S. Department of Agriculture, 2016). The caloric intake

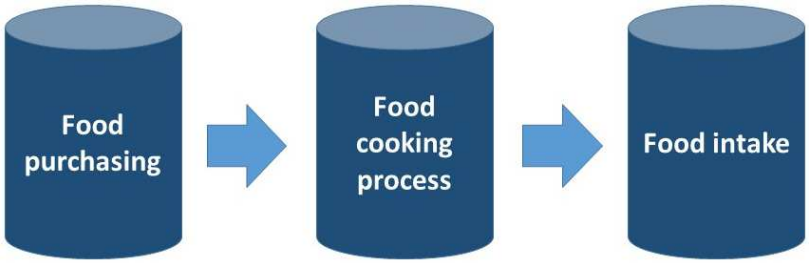
represented a mean of 127±49% from the caloric recommendation. The means of the macronutrient proportions were 56.2% for carbohydrates, 14% for proteins, and 31% for lipids (Table 4.1).

In order to elicit information about the variables that were influencing their eating behaviors, participants were asked to take pictures of what was important to them about their food world. Participants took between 10 and 27 pictures, amounting to a total of more than 500 pictures among all the participants. Forty-eight percent of the photos taken by participants were used during the interviews (pictures selected by participants or researchers). Pictures captured everything such as: meals, the food preparation process, social events with family and/or friends, children and spouses, and various food vendor sites. The vendor sites included: restaurants, farmer's markets, and grocery stores. Participants were asked to name the photos with titles that represented the pictures' semantic values—that is, what the pictures meant to them personally.

The initial results are representative of the participants' eating behaviors. From the descriptive analysis, participants' narratives were centralized on three main eating behavior clusters: (1) the purchasing of food, (2) the cooking process, and (3) the intake of food. All participants mentioned the location and the reasoning for having shopped for their food in certain places, especially fruits and vegetables and the products that they ate on a daily bases. They also indicated how and why they cooked using certain kinds of techniques or certain combinations of food. Finally, participants made references to what food they ate, why they consumed them, and what time and with whom they consumed the food. We considered that there is a chain of interactions between these three clusters and that they comprise the foundation or pillars of women's eating behaviors (Figure 4.1). Participants first bought the food, then they cooked it,

and finally they ate it. Therefore, the variables reviewed in this study are not limited to food intake but include other behaviors that come before the process of consuming food.

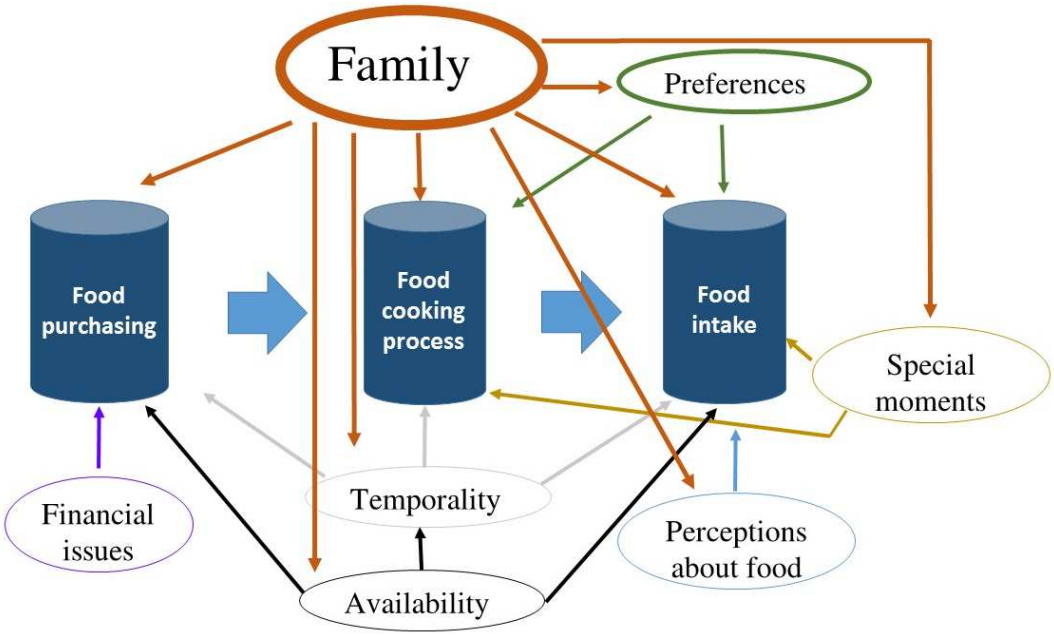
Figure 4.1 Pillars of eating behavior



4.1 Results of Aim 1. To explore the variables that influence the eating behaviors of women from low SES in Santiago, Chile

From the analysis of the participants' narratives, we found seven themes that were influencing the three pillars of eating behavior mentioned above. The seven themes were titled based on generalized statements gathered from the responses of the participants. The titles were provided simplified categorical descriptors summarizing the focus of the themes. The descriptors are indicated between parentheses, as follows: Theme 1:"*Everything is related to my family*" (Family), Theme 2:"*It is about the time*" (Temporality), Theme 3: "*I eat it just because I like it*" (Preferences), Theme 4: "*I do not have enough money*" (Financial Issues), Theme 5: "*During a special moment*" (Special Occasions), Theme 6: "*This food is…*" (Perceptions) and Theme 7: "*If I have it at home or if I can find it in my neighborhood (*Food Availability). With these themes, we developed a model of interaction between the Chilean women and their eating behaviors. This model is shown in Figure 4.2.

Figure 4.2 Model of the influences on Chilean women's eating behaviors



Theme 1: "Everything is related to my family" (Family)

"Family" was found as the most important factor that influenced the eating behaviors of participants, and for this reason, it has been highlighted in the model created in Figure 4.2. "Family" influenced shopping for food, the cooking process, and food intake. In fact, it was difficult to separate the discussion about the participants' diets from their family diets. Participant usually used the word "we" (referred to their closed family) to answer the questions about their own diet. This last point is observed in the following quotes:

Interviewer: “From what is in the photo here (Image 4.1), what do you usually eat?

J17: “These days *we* are eating pasta, rice, and oil, which are used in every meal…”

Image 4.1, Not Titled

“When *we* have tea time… *we* do not drink tea, *we* drink fruit juice… instead of soda [we drink juice] and it is always red… *we* make sandwiches” (P1)

Husbands/partners influenced the kind of food that women bought and cooked, the time in which they ate, and the extra food that they could consume. Their husbands or partners usually brought food to them as gifts. Some of the participants also said that they began to incorporate different foods to their diets or began to gain weight when they got married.

“(About Image 4.2)… he has a sweet tooth, but it is not like he tells me ‘S, make a cake’... He says, ‘it’s been a long time since you’ve made something delicious’... then I understand and make it [a cake]” (S12)

Image 4.2, Titled “*Feliz! (Happy)*”

> "Here, my husband is the one that feels tempted, so sometimes he brings something and I tell him, 'No! Why did you bring this?' (Image 4.3)... [but] he tells me, 'It is a just a little something, what is it going to do to you?', but that little something is never just a little bit of something…" (T20)

Image 4.3, "Not Titled"

Similarly, children influenced the kinds of food that participants ate, the way that they ate the food, and the time in which they ate. They tried to meet the needs that their children had considering the time in which children had to eat; therefore, participants cooked at a specific time to have everything ready at the moment that their children needed to eat. Participants ate at the same time as their children. Other participants indicated that they had to help their kids eat, and for this reason, they had to eat very quickly. Finally, participants also mentioned that they always tried to meet their children's expectations in relation to food, therefore they cooked with their children's considerations in mind. The two first points were mentioned particularly by those participants with little children, and the last point was mentioned by participants who had adolescent kids.

> "... I am used to it: I make lunch, I serve it, and I eat fast because I have to feed the little ones [her daughters] myself since they eat the slowest…" (MI32)
>
> "[I eat at that time] because the kids have lunch early… because they go to school, they have lunch at 12 pm, so during the weekend, they are hungry by the time it is 1 pm..." (C27)

Additionally, participants showed a complete knowledge of what their husbands/ partners and children usually eat; participants knew about the food that their families liked, where they ate, and at what time they ate. This knowledge made participants buy, select, and cook food in the way that their families were most likely going to enjoy it.

> "I prepared 'porotos con pirco' [a traditional Chilean thick stew of whole beans, corn and fresh basil] and I had to prepare this for them (Image 4.4)... because she [one of her daughters] does not eat beans, one of them [another daughter] does not eat corn… the other one does not eat green beans, and the last one does not eat anything…" (MI32)

Image 4.4, Not Titled

> "...because my husband also does not eat salad, he is rather 'special', he does not eat cheese, salad, lemon… with me he has changed a little bit, he did not eat legumes… now he does…" (N51)

Participants indicated the strong influence that their "family", particularly their husbands and their children, have on their eating behaviors regarding purchasing, cooking, and eating food. The knowledge that participants had concerning their family members' eating habits also influenced their behaviors.

Theme 2: "I eat it just because I like it" (Preferences)

According to our model of influence (Figure 4.2), "preferences" determined what participants ate or did not eat on a daily basis, or how they cooked food. In addition, as is observed in our model (Figure 4.2), "family" also influenced the participants' preferences, but participants also reported that when they could, they ate what they liked, mainly when they were at home alone. The participants referred to these preferences as food taste, texture, cooking methods, and the like.

"…because I do not like how others prepare fish (Image 4.5)… I do not like to go to other places to eat it… I prefer to make it myself… and it is healthier too." (C7)

Image 4.5, titled "*Almuerzo ideal* (Ideal Lunch)"

Interviewer "… and why did you take pictures of food that you do not eat?

N35: "because I think that they are important to have in your diet, but due to the taste and flavor I do not eat them."

As it was mentioned above, "family" influenced the participants' preferences. Despite participants stating that they ate certain kinds of food because they liked them, some of them also mentioned that sometimes they could not eat what they preferred, due to their family. They placed the preferences of their families over their own preferences. For example, they avoided cooking some dishes that they liked because they knew their family members did not like these

meals. Participants indicated that they could not cook two different meals; therefore, they preferred to cook or eat what they knew their family would undoubtedly eat.

> "Something that I love, but I can never cook is legumes… they [referring to her family in [Image 4.6] do not like them and I love them…" (P1)

Image 4.6, titled "*Comprando para la Once* (Buying for Tea Time)"

> "… it is difficult, because I eat everything and something that I have not eaten in a while is *cochayuyo* [a kind of seaweed] because my children do not like it… but I want to make *charquican de coyayuyo* [a Chilean dish with this seaweed, mashed potatoes and squash]… I love it, but I have not made it for the same [reason]… because my children are not going to eat it" (J19)
>
> "… I like *caldillo de pescado* [fish soup], but they [her children] do not like fish. They do not like sea food, so I cannot make dishes with seafood… I can make fried fish because the oldest one is going to eat it, my husband is also going to eat it, but my youngest one is not going to eat it…" (Y53)

Although "family" exerts a strong influence on participants' preferences, during the interviews, participants also expressed that sometimes, despite their family, they ate or cooked whatever they wanted. But, they tried to adapt their preferences to their family's preferences, as can be observed in the following quotes:

"[By looking at the photo] you can notice that they are all eating pasta and franks (Image 4.7)… and that day I ate an egg and a salad… I do not like hot dogs… we [the family] buy them [hot dogs] for the girls… and I do not like white pasta either…I like [pasta] with sauce or something like that… but they love it [white pasta]" (MI32)

Image 4.7, titled "*La Juliana Desnuda* (The Naked Juliana)"

"…he [her husband] tells me that he does not like soup… but if I make *cazuela* [a Chilean soup with potatoes, meat, and other vegetables] because I want to eat *cazuela*…I give him the meat, the potato, the squash, and I try to make some rice for him…" (C13)

Participants expressed that they ate certain foods or cooked in some ways because they liked or preferred it. But, their preferences were mainly constrained to when they were alone or when they were able to utilize some strategies to compromise their preferences with those of their families. No one mentioned that they could cook something that they just liked, without thinking about what their family members would say.

Theme 3: "It is about the time" (Temporality)

A third important factor mentioned by participants is related to "temporality." This temporality is related to two main factors: what happens during the seasons of the year as well as what happens during the week. "Temporality" influenced what participants bought, how they cooked the food, and what they ate (Figure 4.2).

Participants usually changed their food consumption according to the *seasons* of the year, especially between winter and summer. This was mainly due to the environmental temperature and availability of food. For example, they mentioned that during the winter, due to the cold weather, they do not eat raw vegetables or fruits because these made them feel cold. Participants also stated that during the summer they could find more fruits and vegetables.

> "[During the winter] I rarely eat fruit… because they taste bad and cold… I eat a little salad… I gain weight [during the winter], I lose it during the summer… because during the winter I get cold when I eat salad… so, I change my behaviors during the summer… and the fruit that you can find during the winter is just bananas, apples and pears." (S12)
>
> "In the winter, I make *sopaipillas* [a kind of Chilean fried bread that can be made with squash, which is prepared only during winter], cake… [during the summer], I eat fresh, raw food… tomato, lettuce with ham, cheese… all those things that make you feel cold when you eat them in the winter." (P1)
>
> "... I eat the same, I am used to eating vegetables, but prepared as stews [during the winter], so they are warmer for when I feel cold ... but I still use the same type of food …" (B3)

Furthermore, participants mentioned that, depending on the season, there were special foods that they could prepare. This was the case with some meals with different kinds of beans, corn, basil, and other seasonal foods.

"B54: (Image 4.8) these were the first *humitas* [a meal based of corn, onion and basil]

Interviewer: Do you eat this meal during the winter?

B54-ow: No, just in summer because I do not freeze them."

Image 4.8, "*Primera Humita del Verano* (The First Humita of the Summer)"

"*Porotos con mazamorra* [a meal with beans, basil and corn puree]…I love them.. I wait for them during the summer… and here [in the food market], beans are now appearing, so that makes me happy…" (C13)

The *day of the week* was the other temporal factor affecting eating behaviors; participants ate differently on weekdays than they did during the weekend. They stated that they changed the food that they would routinely eat during the weekdays, to eat more "*special foods*" during the weekend. This difference was mainly due to the fact that the weekends are when the family is all at home together. Therefore, once again family influences temporality, as shown in Figure 4.2.

"Lunches are also special when I know it will be the 3 of us... for example on Sundays... I prepare a delicious lunch, lots of salads are made, a bottle of wine is bought, and we share among the three of us…" (S12)

"(About Image 4.9) During the weekend I prepare more savory things such as sautéed potatoes, French fries…once a week I make fried food…roasted meat… sometimes I make sushi, something more savory [during the weekend]" (MC26)

Imagen 4.9, titled "Agustin Hip Pop (Hip Hop Agustin)"

"Temporality" has two dimensions: the seasons and the days of the week. First, the seasons of the year influenced what foods could be purchased, how foods were cooked and how foods were eaten. This theme was related to the availability of food and the environmental temperature. Second, the participants stated that they changed their food routine that they have during the weekdays, to one less structured and more relaxed during the weekends.

Theme 4: "I do not have enough money" (Financial Issues)

"Financial aspects," such as economic needs, budget, and price of certain kinds of food, were also found to influence the kinds of food that participants bought. Most participants stated that the budget that they had was not enough to buy everything that they wanted to buy. This last point was because participants also mentioned that they had to cover other expenses, such as house bills.

"…talking about olive oil (Image 4.10), if I could, I would use it every day…but, again we come back to the issue of cost… I cannot do it [buy olive oil]…" (P21)

Image 4.10, titled "Almuerzo Ideal (Ideal Lunch)"

"This (Image 4.11) is a meat store near to my house… it is cheaper… I have a budget for food, but it is not enough… I would like to buy more meat and vegetables… I do not usually eat salads…rice and pasta are the basis of my diet… this is because they [rice and pasta] are cheaper than vegetables…" (P10)

Image 4.11 titled "*La Carnicería en mi Casa es mas Barata* (The Meat Store Near My House is Cheaper"

Although most participants received an inadequate budget, it was their job to make it work, especially when purchasing food. They decided how to organize their food budget in order to make it last all month. Some of them indicated that, even if they did not have a defined food budget, they still tried to organize the money that they received.

"Interviewer: Do you have a weekly or monthly budget for food?

P21: No. I have to make it with the money that I have in a specific moment… and R [his husband]'s salary arrives, and I organize myself, I pay the bills and so on…"

> "By the middle of the month I pay the bills, and at the end of the month when he [her husband] brings it [the money] to me, I use it for the supermarket… this is the way it works for me…" (L16)

In addition, the price of food determined where participants bought their food. Participants indicated that they preferred to buy food, especially fruits and vegetables, at a farmer's market, because prices there were lower than at grocery stores. This comparison was made, particularly between farmer's markets and the small, family-owned grocery stores near their homes (not a supermarket).

> "Interviewer: And where do you buy your fruits?
>
> L16: At the farmer's market.
>
> Interviewer: Why do you buy them there?
>
> L16: Because it is cheaper and you can select [the fruits]"
>
> "The thing is that at the farmer's market, fruit and vegetables are cheaper, even some cookies, and groceries are cheaper at the farmer's market" (I15)
>
> "[I buy] almost everything in the farmer's market… fruits, vegetables, some groceries… and [I also buy] other stuff at the supermarket, but the bare minimum in the supermarket… I do not like the supermarket… because you go there and you spend more money than what you had planned…" (R48)

"Financial issues" were related to the economic needs, the insufficient budget that participants had to buy what they wanted, and the high prices of certain foods that affected the participants' budget. This theme affects mainly the purchasing of food. Participants indicated

that due to competition with other home expenses, they tried to balance the budget in a way so that allowed them to buy enough food for the entire month.

Theme 5: "During a special moment" (Special Occasions)

As mentioned above, weekends were considered special occasions by participants, and this influenced the way in which they ate; yet, there are other moments in which participants cooked and ate differently as well. These moments are related to specific dates, such as Christmas or New Year celebrations, birthday celebrations, or other special occasions in which they deviated from their traditional routine. These special occasions were opportunities in which family and friends met with the participants. "Family" also influences this theme (Figure 4.2).

> "A barbecue was also eaten for the New Year celebration…with pork, beef, sausage… and the next day we went to the pool and we ate barbecue, hamburgers… that sort of thing… for Christmas Eve we had pot roast with rice…" (V22)

> "That (image 4.12) is my cousin's house. He had his housewarming party… he invited us to see his new house and, obviously they had a barbecue…" (B52)

Image 4.12 titled "*Un Gran Evento* (A Big Event)"

Special dates or special days that participants enjoyed with their family and friends influenced the way in which they cooked and the food that they ate.

Theme 6: "This food is…" (Perceptions about Food)

The perceptions about the health factors of different foods influenced women's decision on what and what not to eat. Some participants even described certain foods as "*enemies*" of their general health or body weight. This theme is related to the degree of knowledge that participants had about food and nutrition. This knowledge came mainly from the internet, television, particularly TV shows for housewives, and other family members, such as their mothers, grandmothers or mothers-in-law. Therefore, family is also considered an influential factor in the perceptions these women had about food (Figure 4.2)

> "… It is like, the thing about bananas is that they make you gain weight… maybe it is not true, but in my mind it is like: 'If you are going to prepare fruit, no bananas', fruit salad without bananas…" (J19)

> "… when I am thirsty I try to drink water… I do not drink soda or juice… because I think that soda does not quench your thirst… soda makes you fat… so now I drink water… (Image 4.13)" (V30)

Image 4.13, titled "Dia especial (A Special Day)"

> "mmm… no, no… I drink it [milk]…but I do not have it very frequently… [Interviewer: why do you not drink milk?]… It does not benefit [your health], I mean, research has reported it has no benefits for you…" (R48)

Perceptions about certain foods determined the food intake among participants. These perceptions were related to the degree of knowledge or the opinion that participants had towards food and sometimes this knowledge or appreciation was incorrect.

Theme 7: "If I have it at home or if I can find it in my neighborhood…" (Availability of food)

Participants indicated that the availability of food at home made them eat more or less of those foods. They indicated that sometimes they had food for their kids at home and they would take advantage of that and eat those foods more frequently (Figure 4.2). These foods consisted of snacks that participants (or their partners) bought for their children's school. As one participant said,

> "…The thing is that the girls have [to take] snacks [to the school]… when they go to school. We bought snacks for the whole week… so, from March to December there are always yogurt, cookies, chips, chocolate at home… If there are cookies [at home], I watch the soap opera [on TV], and have one [of the cookies]" (MI32)

Participants also mentioned that if foods were available in their neighborhood (near their home or their office), it was more probable that they bought and ate it.

> "This (Image 4.14) is my breakfast for a weekday [at work]… it is half a bread bun… on this occasion, we [the participant and a colleague] did not find sliced bread … at this time there was probably no sliced bread at the supermarket [near to her office] and we had to buy hallulla [the kind of Chilean bread that appears in Image 4.14]." (C27)

Imagen 4.14 titled "Desayuno Ideal (Ideal Breakfast)"

> "I have a bakery [that I go to] when I pick up my son from daycare… there is a bakery there… they sell the lemon pie that my mom likes, other cakes that we eat… or bread with cheese that is delicious…" (V22)

Most participants evaluated their neighborhood as a place where they could find most of the food that they needed. They mentioned having several small grocery stores to buy what they needed in an emergency, farmer's markets several days a week, and at least one supermarket close to them. Accordingly, they stated that most of these places where they bought food were near their homes, or that they could easily access those places. However, sometimes participants decided to travel a little bit farther from their neighborhoods to find cheaper food.

> "I have access to everything… everything that I need… I have two supermarkets, the farmer's market is close [to her house]… I have everything available…" (B3)
>
> "[I bought] the food, the vegetables in the farmer's market… here we have several farmer's markets… the good thing is that we have farmer's markets on Tuesday, Wednesday, Thursday and Friday… we have farmer's market almost every day… ah! On Sundays…" (V33)
>
> "I took this picture (Image 4.15) because it is important… most of the time I buy [food] here… and I think it is important because I have to buy bread and hot dogs for breakfast here… for lunch [I buy] frozen chicken there… sometimes [I buy] bread for tea time…" (D7)

Image 4.15, Not Titled

In addition, few participants mentioned the high availability of unhealthy food in their neighborhood. They stated that you can find these foods in the small grocery stores next to their homes or in food carts that were distributed in their neighborhoods. One of the participants stated that these food carts were in front of health institutions.

Participants indicated that having certain foods at home made them eat more of those foods and having more foods available to them in their neighborhoods resulted in participants buying and eating more. Participants commented that their neighborhoods had plenty of options when it came to being able to find a place to purchase food.

In summary, we found seven themes directly influencing participants' eating behaviors. The strongest influence was the "family", which in turn affected the other themes which were "preferences", "temporality", "special dates or moments", "perceptions about food", and "the availability of food". The interaction between these variables and the studied eating behaviors can be found in Figure 4.2.

4.2 Results of Aim 2. To compare the influences on eating behaviors of low SES women who are normal weight, overweight, and obese.

So far, we have shown the factors that influence the eating behaviors of a group of Chilean women from low SES backgrounds, which answered our first aim. In order to answer aim two, we divided our participants into three groups, according to their nutritional status (BMI). These three groups are: normal weight (NW), overweight (OW), and obese (OB).

The three groups were very similar in terms of demographics (Table 4.2). There was a tendency that more OB had NCDs, especially diabetes, hypertension, or dyslipidemia (71% versus 20% in NW and 28.6 in OW). In addition, the OB group tended to be more sedentary than the other groups. Calorie or nutrient intake were very similar between the groups (Table 4.2).

Table 4.2 General characteristics of participants by nutritional status (n =31)

Characteristic		Normal weight n=10	Overweight n=14	Obese n=7
Age in years (mean ± DS)		38.7 ± 4.1	35.7 ± 5.3	38.5 ± 9.3
Number of children (median and range)		2 (1 -4)	2 (1-4)	3 (1-5)
Educational attainment (%)	Less than 12th grade	10	0	28.6
	High School	50	78.6	57.1
	Technical	30	21.4	14.3
	College	10	0	0
Work status	Unemployed	80	64.3	85.7
Monthly household income (US$ per capita) (mean ± DS)		190.7±117.5	207.9±166.2	154.1±79.6
Kind of health insurance (%)	Public	100	85.7	85.7
Presence of NCD (%)	Yes	20	28.6	71.4

Table 4.2 (*Cont.)*

Characteristic		Normal weight	Overweight	Obese
Any kind of aerobic exercise (%)	No	50	78.6	100
Any kind of resistance exercise (%)	No	90	100	100
BMI (mean ± DS)		23.7±1	27.9±1.8	34.2±3
Calories intake (cals/day) [1] (n=22)		2213.4±1052	2403.8±978	2190.7±618.8
% of recommendation[2]		123±59	133.5±54	121.7±34
Macronutrient intake (n=22)	Carbohydrates (gr/day)[1]	273.5±129	353.6±140	311.7±117
	Carbohydrates distribution[3]	50.3±8	59.7±8.7	56.2±6
	Proteins (gr/day)[1]	82.7±42.7	75.2±29.8	84.2±16
	Protein distribution [3]	15.2±3	12.9±3	16±3.4
	Fat (gr/day)[1]	90.8±46.5	81±44.6	72.9±20
	Fat distribution [3]	36.5±5	28.9±8	30.2±5

Note: 1. Mean ± DS
2. Source: U.S. Department of Agriculture, 2016
3. Macronutrient distribution range in relation to the caloric intake

We adopted a mixed method approach for the analysis of aim 2. Participants were grouped based upon their nutritional status (NW, OW, or OB), and quantitative and qualitative data were obtained per groups. The results of the analysis of each group is divided into two parts.

First, we examined once again the seven previously discussed themes that were found across all participants (aim 1). Results are presented below, starting with the quantitative data, which account for the proportion of participants in which a particular theme was found as divided by each group, as well as, the number of times that participants mentioned anything related to a theme during their narratives (called Repetition in Table 4.3). After this quantitative analysis, we present the results of the qualitative analysis by group (Table 4.4), when we conducted a search for qualitative patterns for each theme found in aim 1, inside of the groups.

Second, we sought for new themes within each group following the same procedure used for the first part of this section. We also conducted a quantitative (revision of proportion and repetitions) and qualitative analysis (searching for patterns).

Table 4.3 Percentage of participants and repetition for each theme by participant's nutritional status

	Normal weight n=10		Overweight n=14		Obese n=7	
Theme/Variable	%	Repetition	%	Repetition	%	Repetition
Family	100	12.9	100	15.6	100	17.3
Preferences	100	10.3	100	10.4	100	8.4
Temporality	90	7.7	100	7.3	85.7	6.9
Financial issues	90	7	92.9	5.5	85.7	14.1
Special occasions	80	3.1	85.7	2.2	71.4	4.1
Perceptions about food	100	5.5	100	5.9	100	8
Availability of food	80	3.5	85.7	3.7	85.7	6.1

Note. Repetition= mean of time that a team is mentioned.

Table 4.4 Summary of differences pattern within themes by nutritional status group

Theme-variable/ nutritional status	Normal weight	Overweight	Obese
Family	"I cook it because others asked me for it"	"I cook it because others asked for it"	"I cook it because others asked for it"
	"I eat it because others told me about it"	"I cook it because others like it"	"I cook it because others like it"
		"I ate it because it represents a family moment"	"I ate it because it represents a family moment"
		"I eat it because they brought it to me"	"I cook it because it is good for them"
			"I depend on what others decide"
Preferences	"I like this… but I do not like that…"	"I like this… but I do not like that…"	"I like this… but I do not like that…"
	"I like this because…"	"I like this because…"	"I love this food!!!"
Temporality	"I eat especial food during the weekend"	"I eat especial food during the weekend"	"I eat especial food during the weekend"
	"My food intake depends on the weather"	"My food intake depends on the weather"	"My food intake depends on the weather"

Table 4.4 (*Cont.*)

Theme-variable/ nutritional status	Normal weight	Overweight	Obese
Temporality (Cont.)	"During this season there are special foods"	"During this season there are special foods"	"During this season there are special foods"
		"My weekends are with family"	"My weekends are with family"
		"My fruit and vegetable intake changes during the year"	"My fruit and vegetable intake changes during the year"
Financial issues	"I control the money…"	"I control the money…"	"I control the money…"
	"I cannot eat it because I do not have money…"	"I cannot eat it because I do not have money…"	"I always look for the cheaper one…"
	"I always look for the cheaper one…"	"The money that I have is not enough"	"The money that I have is not enough"
		"I eat that food when I have money"	"This food is so expensive"
			"I would eat healthier if I had more money"
Special occasions	"I prepare special meals…"	"I prepare special meals…"	"I prepare special meals…"

Table 4.4 (*Cont.*)

Theme-variable/ nutritional status	Normal weight	Overweight	Obese
Perceptions about food	"This food is good/bad, so I eat/do not eat it…" "This food has more nutrients or is good/bad for my health"	"This food is good/bad, so I eat/do not eat it…" "This food has more nutrients or is good/bad for my health" "I must have this food" "This food increases my weight"	"I must have this food" "This food increases my weight" "I have heard some myths about it"
Availability	"I can find everything what I need"	"I can find everything what I need" "…because that food is at home"	"I can find everything what I need"

Note: The same patterns between the groups have the same colors.
The black patterns are those that appeared only in the corresponding group.

4.2.1 Reexamination, by groups, of the themes found across all participants (from aim 1)

Theme 1: "Everything is related to my Family" (Family)

Across all three groups, "family" was consistently one of the most important factors of participants' eating behaviors. This theme was mentioned by 100% of participants in each nutritional status group. OW and OB women tended to mention it more often during the interviews than those of NW (Table 4.3).

The information above coincides with what was found in the descriptive analysis of the "family" theme by group, in which more qualitative patterns were discovered in the OW and the OB groups (Table 4.4). The three groups agreed that they cooked or prepared some meals because a family member asked them to. In addition, participants cooked meals because they felt that their family members could need them or want them.

There were two patterns that were found only in OW and OB participants. First, participants indicated that they cooked or bought specific types of foods due to the preferences of their family members; it was in these two groups where it was more likely that participants put their families' preferences over their own, since they knew what their husbands/partners or children liked and they tried to prioritize those preferences.

> "In my house, they [her family members] are picky, they do not like this… they do not like that… so I get tired of that, and I try to make something that everybody likes…" (C27-ow)
>
> "…furthermore, she [her daughter] does not like eating salads… so I think: 'Why am I going to prepare a salad [just for her],' so I eat in a simple way [no salads]" (D7-ob)

These quotes also demonstrate that participants from these groups tried to avoid conflict related to food with their family members.

Second, both groups said that they ate or cooked certain foods because it represented a family habit that was enjoyed by them and the rest of the family.

> "This is mid-afternoon (Image 4.16)… we [she and her daughter] ate grapes with my daughter… because we wanted to eat something fresh…" (B54-ow)

Image 4.16, titled "*Uva Helada* (Cold Grapes)"

> "…because I wait for my husband to get home, and then we have tea time at 7.30 p.m." (C13-ob)

There were some patterns that appeared just for one of the groups. NW participants frequently mentioned that they ate some food or had other eating behaviors because someone in their family recommended it. In this case, NW family members served as sources of information for behavioral change.

> "I have a cousin… she says to me: 'look T, in the morning, you eat 4 cookies with a piece of light cheese and a cup of tea, or you eat a half a toast with light butter, or anything light'… then she tells me 'for lunch, have this and at night, that'…" (T20-nw)
>
> "So, my sister… she sometimes shares [nutritional] information that she gets [with me]" (B3-nw)

In the case of the OW group, one pattern was evident in relation to their families. They indicated several times that they ate a certain food because someone in their family gave it to them or cooked it for them. This was mainly associated with a husband/partner.

> "…that was my breakfast last Sunday, because they [her husband and her daughter] went to a birthday party and they brought me cake… at night I ate half of it, and the next day I ate the other half, with a coffee…" (V33-ow)

> "(Image 4.17) a chocolate that [my husband] gave me for Valentine's Day…" (B54-ow)

Image 4.17, Not Titled

There were two patterns that appeared most frequently in the OB group. First, their role as the family caregiver was most important to them because they felt responsible for their families' well-being and therefore they bought, cooked, and ate food that allowed them to take care of their family members' health. They mentioned that they took greater care of the health of their families than they did of their own health.

> "… no, it is not just for me [the food daily budget], the others have to eat too… 'How could I think about myself as the only one that is going to eat?'…" (D7-ob)

> "For me, I am fine if I have [just] a lettuce salad…but, what am I going to give the kids? They cannot eat just a lettuce salad because they are growing… (Y54-ob)

> "So, I try to look for things that I know my family likes, but that are healthier… My husband is getting to an age in which I try to take care of his diet. He does not like many things… for example, I cook with less fat, I bought him sugar with fewer calories, I try to

use vegetables that he does not eat, I prepare different kinds of salads, because he just eats lettuce… I know that food has a relationship with health… but I worry less about my own health" (S12-ob)

Second, OB participants seem more dependent on others within the family, when deciding what to buy, eat or cook, especially those who were living with another female relative at home, such as their mothers or mothers-in-law. In addition, OB participants often tried to accommodate their eating or meal schedules around others availabilities.

"During the weekends, she [her mother] prepares the lunch, so she tells me to buy [food] to make lunch, very early…" (C13-ob)

"So, they [others in her family] gave me a double serving… they told me 'You are pregnant and have to eat for two', so, I had a double serving, and I was ignorant… I had to eat everything, and they [family] did not allow me to stand up [from the table] until I ate everything" (Y53-ob)

As demonstrated above, "family" was a strong influential factor by various ways to all participants, especially among overweight and obese participants. Participants in the overweight and the obese groups mentioned more about how their family influenced their eating behaviors in a variety of ways. Clearly, obese and overweight participants are dependent on their families to make decisions around food.

Theme 2: "I eat it just because I like it" (Preferences)

The theme that was presented in aim 1 with regards to "preferences" was confirmed by groups, as it was mentioned by 100% of participants in the three groups (NW, OW, OB). This theme was mentioned several times during the conversations and was equally indicated by all groups (Table 4.3).

When we reviewed the qualitative pattern inside each group, we found that all participants listed specific foods that they usually ate or did not eat, because they liked or disliked them. But, only the NW and the OW groups were able to indicate the reason of why they liked or disliked certain foods. These reasons were associated with some characteristic of different types of foods, such as taste, smell, or texture.

> "[In relation to avocado] I looked at the hotdog with avocado and *yuck*!... I did not like it because of its consistency and the color…" (P21-n)
>
> "I don't eat beans or lentils… I don't like *cazuela* [a typical Chilean soup with meat, potatoes, squash and corn], I don't like pasta… I don't like the taste… I don't like how you feel after you eat them [those foods]…" (V30-ow)

One pattern was only present in the OB group: their "*love*" for a certain food or foods. The participants in this group mentioned several times that they liked a certain food, but when they wanted to express something they found delicious, they express their *"love"* for this food.

> "I love bean salad…" (S12-ob)
>
> "Uy! That is something that drives me crazy… bread with butter… I love toast with butter on them…" (R48-ob)
>
> "… The truth is that I like… I love green beans, with onion and cilantro" (Y53-ob)

Participants in the obese group indicated that they just do not "*like"* some food, but rather indicated that they "*love*" some food. This result indicates that obese women have a strong feeling towards food preference.

Theme 3: "It is about the time" (Temporality)

"Temporality," either the day of the week or the season of the year, was found to influence eating behavior in more than 85% of participants when assessed by groups. "Temporality" was equally discussed among the three groups (table 4.3). The three groups had three similar qualitative patterns: one was related to the days of the week and two were related to the season. The OW and the OB groups exhibited two additional patterns that did not appear in the NW group (Table 4.4).

In relation to changed eating behaviors during weekends when compared to the weekdays, participants in the three groups said that they ate different foods during the weekends, confirming findings from aim 1 when participants were analyzed together. Participants bought or cooked different foods for Saturdays and/or Sundays meals. OW and the OB groups justified these changes in eating routine due to their families. These participants highlighted that they tried to make the weekends special days for their families. The intersection between "family" and "temporality" was observed among the OW and the OB groups.

> "Sometimes, when my husband is here [at home during the weekends], we go to my mother-in-law's or my mom's house…so, I do not cook, we eat at another place…" (MI32-ow)

> "So, the only day that I have to distract myself and enjoy being with my family is during the weekend, so I work hard to make something delicious at home…although I spend one hour in the kitchen [and they eat quickly]…(D7-ob)

In relation to the seasons, one common pattern for the three groups was that the weather or the environmental temperature influenced the kinds of food they ate, confirming findings from aim 1 when participants were analyzed together.

Another pattern related with "temporality" was found just in OW and OB participants: During the different seasons of the year, the participants' fruits and vegetables intake changed. Higher consumption of fruits and vegetables were reported during the summer and lower during winter. The reasons for reporting this change on this eating behavior were the availability of these foods during the different seasons and, as was mentioned before, the environmental temperature.

> "I like the fruits of this season [summer], there is more variety, the peaches, the watermelon…" (T20-n)
>
> "In the winter, we [she and her family] do not eat desserts, such as ice cream or fruits…due to the issue of variety during this season, there are fewer fruits…" (MC26-ow)
>
> "…during the summer you can get more fruits. In the summer, you can go to one grocery store or another and you are going to find them [fruits]…but during the winter… nothing… you can't even find special fruits at the supermarket [such as melon or watermelon]…" (C13-ob)

There were three patterns found in the "temporality" theme across the three groups: two related with the day of the week and one with the seasons. Additional patterns were found when analyzing narratives of overweight and obese participants, which could demonstrate their higher susceptibility to temporality issues.

Theme 4: "I do not have enough money" (Financial Issues)

About 90% of participants in all groups mentioned some situation related to "financial issues" in relation to food purchase. A trend was observed among the OB group to discuss this theme more frequently than other two groups (Table 4.3).

Participants from the three groups pointed out that they have control over the money at home. However, only members of the NW and the OW groups said that they had to refrain from eating certain foods because they did not have enough money to buy them, or because they preferred to spend their money on other foods (foods that their families were probably going to need). This food restriction is related to eating out, as well as their ability to buy certain kinds of meat, such fish or beef.

> "If I buy what appears in the picture (Image 4.18, a restaurant advertisement)… I could not eat the next day…" (P10-n)

Image 4.18, titled "*Como de todo* (I Eat Everything)"

> "I like to make it [*reineta*, a kind of fish that can be found on the Chilean coast] in the oven. I like to make *reineta*, but it is more expensive, so for that reason I do not make it very frequently…" (V30-ow)

The NW and the OB groups also shared a similar pattern. Both groups mentioned that they always looked for cheaper foods in the market, trying to save money in some way. Among the strategies that they mentioned were, to select the cheapest places to buy food, select foods that they knew were going to be enough for all family members, and to review sales on food.

> "I am obviously going to buy more for the same amount of money…because it is so much more [more expensive] here [grocery stores near to her house]. In *Veguita* [a place when she can find cheaper fruits and vegetables], a kilogram of tomatoes costs $1.00, and here [grocery store near to her house], it costs $2.50." (B3-n)
>
> "…for example, I buy four chicken legs… I pay $3.50 and there are 4 legs, for four people, and that is enough… but chicken tenders… a kilogram costs $5.00. It is not enough for everybody; I would have to give a little piece to each one …" (C13-ob)

When problems with money were mentioned by the OB and the OW groups, it was usually in relation to not having enough to buy all that they wanted for their family or for them.

> "I think a factor could be the lack of money… for example, you see breakfast… you should have a breakfast fit for a king [referring to more quantity and quality]… you do not have enough money to have special ham or light cheese, and have orange juice, and have milk and coffee and whole grain bread… if you add that to our pocket [the

budget]… it means more money, and you cannot always buy and eat those things" (V33-ow)

"No [about if her food budget is enough for having everything that she wants]... I would like to have more of everything [different kinds of food]… for example, it is really sad to get together during tea time [with her family] and have just butter… I like to have every type of food on the table… by having that I am so happy…" (S12-ob)

For those who felt that they had enough money, it was due to the fact that some of the participants looked for other sources of income, like selling homemade food to their neighbors. This extra work helped them with the income and to overcome some money constraints. Although important, the extra money was irregular, so they could not count on that same amount of money every month.

The fact that certain kinds of foods were bought just when participants had money was a pattern only found in the OW group. This moment of having money was related to the moment in which they or their husband had received their paycheck (in the middle of the month or at the end of the month).

"Very rarely do we have soda… sometimes [we have] juice, and when we have [money] to buy soda, we do, if not, just juice…" (P34-ow)

"We do not have cheese very much, due to the budget. You buy pate, butter, eggs… [cheese, it depends] if there is money or not…" (N35-ow)

Most participants from the OB group mentioned some foods that they perceived as expensive. They mentioned certain kinds of meat, vegetables, such as tomatoes and avocados,

and some fruits, such as strawberries and cherries. This finding links participants' perceptions about whether or not they could eat healthier to their financial situation.

> "I have to eat light crackers or whole grain bread… I have bought whole grain bread a couple of times, but then, I did not have money to buy it again… I do not have money to buy pita bread or a bag of whole grain bread… so what are you going to do?" (C13-ob)
>
> "… she [the nutritionist] told me, 'Big mistake, you cannot stop eating', and she told me that I have to eat five times per day. I started doing it, but the budget was not enough… about salt… my budget doesn't allow for me to buy special salt…" (Y53-ob)

In summary, "financial issues" was a theme that showed large variability across each group. Obese and overweight participants reported specific patterns related to "financial issues".

Theme 5: "During a special occasion" (Special Occasion)

This theme was mentioned in similar ways among the three different groups. In addition, similar patterns found in aim 1, when participants were analyzed together, were found in the three groups. All participants stated that there were special days and special occasions when they ate or cooked something different compared with most days. Some examples of quotes that illustrated the similitude between groups are:

> "There are end of the year parties [Christmas Eve and New Year's Eve] where the *Pan de Pascua* [a kind of sweet bread with candied fruit and nuts] is commonly served… During these celebrations, you visit friends and family, and the *Pan de Pascua* is typically offered to you upon arrival … and it [*Pan de Pascua]* cannot be refused…" (T20-nw)

"This [Image 4.19] was tea time on a Friday… it was our anniversary, and I made a cake…" (MC26-ow)

Image 4.19, titled "*Aniversario* (Aniversary)"

"We [she and her family] need to have bacon during parties… I do not care how it is prepared… and [another food that has to be present] either duchess potatoes or stuffed potatoes." (S12-ob)

Theme 6: "This food is…" (Perceptions about Food)

Different kinds of "perceptions about food" were mentioned by 100% of participants in all groups. This theme was associated mainly with their intake of food. The three groups repeated this theme similarly (Table 4.3).

In the qualitative analysis, unlike the other themes, no common patterns were found in this theme between the three groups. NW and the OW groups shared two patterns. First, both groups indicated that they perceived certain foods as healthy or unhealthy, and they would therefore eat or not eat those respective foods. These perceptions were related to what they had seen on television, recommendations they had received from others, and their own level of nutritional knowledge. The second pattern is related to the knowledge that participants had. We observed that participants from these two groups were able to talk about the nutritional content or the health properties of different foods, and that this knowledge made them ate more or less of certain foods.

"…because grapes have several properties, like antioxidant, anti-inflammatory capacity, and so on…so [grapes] help to repair the gut, clean the blood, they are an antioxidant, among the fruits… the best for the fasting process; they are anti-carcinogenic" (B3-n)

"Sometimes… on rare occasions… I have cultured milk, to help me with digestion…" (V30-ow)

Most of the participants in the NW and OW groups were able to talk about carbs, specific types of fat, and other nutritional content of different foods. Also, some of the participants were able to associate these nutrients with health conditions, such as diabetes or hypertension.

The OW and the OB groups also shared two patterns. Both groups of participants indicated that there were some essential foods that they must have at home. Participants were always worried about buying these foods because they were important for them and their families. They called these foods "*essentials.*"

"You try to have the basic stuff, like rice, pasta, [tomatoes] sauce, oil, salt, sugar, snacks for the kids, milk… we cannot run out of rice, pasta, oil or flour ..." (J17-ow)

"This [in reference to Image 4.20] is what can never be missing in our pantry… they never fail: [tomatoes] sauce, rice, pasta" (Y53-ob)

Image 4.20, "*Habitual* (The Usual)"

In addition, OW and OB groups mentioned some foods that were related to increase body weight. It was in these two groups where the perception of different foods as enemies was found,

and for this reason, participants tried to avoid or reduce them in their diets. The main foods that these groups tried to avoid were bread and soda.

> "[I should avoid] bread… that is the first thing… I am eliminating it… [I am having] half a toast in the morning…" (E14-ow)
>
> "I buy half a kilogram of bread, five pieces of bread, so one piece of bread for each [her family members]. I do this so I do not eat so much… I think that [bread] keeps me fat" (B52-ob)

We found a unique pattern in the OB group. Obese participants mentioned perceptions about foods that are related to some myths that are part of the Chilean culture. These myths led them to eat more or less certain foods. Some examples of these myths are shown in the following quotes:

> "…because people should not eat carbs mixed with protein…" (S12-ob)
>
> "I drink herbal tea… it help to burn fat… so hot water after the meals… hot water after each meal… I think it is going to work…" (D7-ob)

In sum, the "perception about food" theme varied among the three groups. The level of nutritional knowledge that the normal weight and the overweight groups had was noteworthy, as well as the presence of misinformation (myths) that was found in the obese group.

Theme 7: "If I have it at home or if I can find it in my neighborhood…" (Availability of food)

The three groups were very similar in the proportion of participants that mentioned something about the theme of "availability" and the number of times that they repeated something about it (Table 4.3).

As noted in Table 4.4, a qualitative pattern was found among the three groups: "they could find everything they wanted to buy in their neighborhood." OW participants mentioned more frequently that they ate more of a certain food if it was available at home.

"Interviewer: And after lunch, what else do you eat?

B54-ow: If I have fruit [at home], I eat a fruit… and if I do not have any, I drink milk."

"…I mean, when there is this *women water* [a flavored sparkling water] I drink it… if not, I drink tap water" (C27-ow)

This theme showed similar patterns among the three groups. Overweight group showed a link between eating behavior and the availability of food inside participants' homes.

4.2.2 New themes identified by groups (Normal weight, Overweight, and Obese)

When divided by groups based on nutritional status to search for themes that influenced the participants' eating behaviors inside each one, additional new ones were identified. These themes and their presence in each nutritional status group are shown in Tables 5 and 6. Newly identified themes were mainly from the group of OB participants. In the same way that the previous descriptions of the themes were presented, these new themes were also titled using the participants' voices and a simplified word was used to refer to corresponding theme along the text.

Table 4.5 Percentage of participants and repetition for each new theme by participant's nutritional status

	Normal weight n=10		Overweight n=14		Obese n=7	
Theme/Variable	%	Repetition	%	Repetition	%	Repetition
Psychological and emotional status	60	2.1	64.3	2.4	71.4	2.6
Health condition	70	2.9	57.1	1.4	100	2.4
Physical appearance	60	0.8	35.7	1.14	85.7	2.4
Past experiences of failure	40	0.9	50	1	85.7	1.7
Gender role	50	2.8	57.1	2.07	85.7	4.6
Perception of difficulties and obstacles	50	0.9	85.7	2.6	85.7	3

Table 4.5 (*Cont.*)

	Normal weight n=10		Overweight n=14		Obese n=7	
Theme/Variable	%	Repetition	%	Repetition	%	Repetition
Perceptions of lack of time	80	2.6	42.9	0.7	42.9	3.4

Note: Repetition= total times that the theme was mentioned/number of participants.

Table 4.6 Other factors that influence women's eating behaviors by nutritional status

Theme/Variable	Normal weight	Overweight	Obese
Psychological and emotional status	0	0	*"I do not feel mentally well…"*
Health condition	0	0	*"There is an illness that does not allow me to eat normally…"*
Physical appearance	0	0	*"I do not like how I look …"*
Past experiences of failure	0	0	*"I could not do it in the past…"*
Gender role	0	0	"It is what I have to do…"
Perception of difficulties and obstacles	0	*"It is so difficult to eat healthier"*	*"It is so difficult to eat healthier"*

Table 4.6 (*Cont.*)

Theme/Variable	Normal weight	Overweight	Obese
Perceptions of lack of time	*"I do not have time…"*	0	0

Note: 0= absence.
In the case of obese group, presence was considered if the theme was found in 71.4% (5 participants) or more.

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Theme 8: "I do not feel mentally well…" (Psychological and Emotional Status)

Several participants mentioned that they have some mental health problems, such as anxiety, lack of self-control, and feelings of sadness (Table 4.5). Five out of seven OB participants mentioned issues related to mental health in their interviews, which is the reason why we considered this a theme for this group. Anxiety was one of the mental issues mentioned by the OB participants, but none of those who indicated it had been diagnosed by a health care provider. One of the participants from this group described this anxiety as follows:

> "I think it [anxiety] occurs because I get a pain in my stomach, like it [the stomach] is saying that 'I am hungry… I am hungry'… I have felt this sensation at 1am… my daughter tells me 'Mom, how can you be hungry?'… but I am hungry!" (B52-ob)

The OB participants indicated that their anxiety led them to eat more without having a reason to do so.

> "I try to eat less, but the problem is that I get anxious, and instead of not eating, I eat… eat and eat…" (B52-ob)

> "Sometimes when I get anxious I start planning what the next thing that I am going to eat is… and then, I am eating… and I am thinking what I am going to eat at tea time…" (D7-ob).

The OB participants also mentioned that for them, it was very difficult to control or stop eating certain kinds of foods. Some of this difficulty is linked with self-control and is associated with feelings of sadness.

> "I buy a box of pineapple ice cream… a big box… and I do not stop [eating it] until I finish it, in just one sitting… so, for me to buy ice cream and know that I have it there [in the freezer]… I know that I am going to eat it… they [her family] arrive and there is no ice cream… When I am sad I want to eat sweet things a lot… I have to go and buy some [if she does not have something sweet], if not, I can't be at ease, even if I do not have money…" (S12-ob)
>
> "When I am sad, I get hungry… but, I do not know if that is hunger, but I think that eating something will help stop the feeling." (P11-ob)

Perceptions that participants from the obese group had about their psychological or mental status made this a theme since participants mentioned it as a trigger that caused them to eat more, losing even their ability to control themselves. Sensations of anxiety and sadness were the problems referred the most by obese participants.

Theme 9: "There is an illness that does not allow me to eat normally…" (Health Condition)

All OB participants stated that they, or someone in their family, had some kind of health condition, such as hypertension or diabetes that influenced the way in which they ate.

"…I have chronic hypertension… I use less salt in meals…" (B52-ob)

"Now, I am buying the "Belmont" brand [a kind of vegetal oil brand]… because it says '0% cholesterol', because I have cholesterol problems…" (Y53-ob)

"My daughter has some problems with processing some foods, like milk… she has like a milk allergy, so the only dairy product that we have is cheese…" (R48-ob)

These health conditions for participants and their family members influenced the kinds of foods that they eat, or the way in which participants in the obese group prepare certain foods.

Theme 10: "I do not like how I look …" (Physical Appearance)

Almost all of the OB participants (85.6%) were dissatisfied with their bodies (Table 4.5). They frequently mentioned the difficulty of buying clothes that they would like to wear, and complained about how they looked in certain kinds of clothes.

"You see other girls and they are skinny… all clothes look good on them… and you [referring to herself] go to the store and nothing fits you…You try to flirt with your husband and wear something tighter… so that you can feel and look more beautiful... but, as you are fat, you feel like you are not attractive to him…" (C13-ob)

"…one day I was going out to buy some clothes and it was very frustrating to enter the store and not finding anything… I tried something on and it did not look good on me… I

looked fat… I felt very bad… the only thing that I wanted was to get out of there and die…" (P11-ob)

Aspects related to aesthetics and body satisfaction were mentioned by the obese group and this was related both to what the participant ate and their intention to reduce weight. As participants felt uncomfortable with their body shapes and weight, they stated that they tried to change the way in which they ate.

Theme 11: "I could not do it in the past…" (Past Experiences of Failure)

A greater share of the OB group indicated that they had failed in past regarding food-related experiences. The OB group indicated that they had tried to change their eating behaviors several times in the past in effort to eat healthier and reduce their weight, especially in regard to what they ate and how they cooked. But, because these previous efforts did not have satisfying outcomes, they had given up on trying to eat better.

"… I have tried to stop eating bread, not drink soda, I drank just water… but, anyway I feel that I did not lose weight… so I am on a diet during 2 or 3 weeks, and I do not lose a single gram… that discourages you" (C13-ob)

"My mom gives me every recipe. The other day, she gave me a recipe on how to lose weight with a lot of vegetables… it was disgusting… but anyway, I did it… after that, [other people] told me, 'Do this', I did that too… it did not work… so I said, "Stop" [to refer to the fact that she will not diet again]." (D7-ob)

As seen above, these obese participants mentioned their frustration when trying to change eating behaviors in the past. Some obese participants also recognized that these changes were made without a health provider's advice. Several other obese participants criticized the nutritionists in the health care centers where they went to seek support. Two of these participants

mentioned that their nutritionists' appointments were impersonal and not appropriated, in the sense that they could not afford the recommended food.

Theme 12: "It is what I have to do…" (Gender Roles)

Eighty six percent of the OB participants pointed out issues related to their role as mothers and wives (Table 4.5). One of the most frequent patterns found related to their role was how they should cook or serve others. Participants identified this as a part of their role in the household and life, particularly as being the role of a wife.

> "If he [her husband] arrives at 3pm, I have the table set at 2:45pm, his plate in the microwave ready to heat up, the [glass of] juice with ice, if it doesn't have ice, he does not drink it…" (S12-ob)
>
> "During the weekend, it is different, it is your husband… you have to prepare something delicious…because your husband is here, he comes home from work, he is tired and he is hungry… so, he is happy [with a delicious meal]… the stomach is happy, the heart is happy, he is happy…" (C13-ob)
>
> "…because I have to be there… working [in the kitchen], while they [her kids] are there seated waiting for me to serve them everything…" (B52-ob)

These gender roles were perceived as something related with how Chilean women are seen in society, passed from generation to generation. This is illustrated in the following quotes:

> "…if I had a daughter I would ask her to cook or to clean the house… because they [their parents] raised me to take care of my husband… they [their parents] raised me to have a family, to spoil my husband and son…" (S12-ob)

From this theme it is understood that participants felt responsible to serve their husbands, because this was their role in their family. They tried to cook for their husbands and prepare everything in relation to their husbands' wants and needs.

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Theme 13: "It is so difficult to eat healthier" (Perceptions of Difficulties and Barriers)

This theme was observed in more than 85% of the OW and the OB groups. Repetition of this theme was observed to be similar in all three groups (Table 4.5).

In Table 4.6, it can be seen that both groups indicated that following dietary recommendations for a healthy diet meant overcoming several difficulties or obstacles. First, most of them mentioned that they got bored from the routine that they had when they are "*dieting*." In addition, some participants mentioned the role of media in making unhealthy food more tempting.

> "I wanted to lose weight, so I followed it [the dietary plan] as it was planned… but after a while I got bored, and as the girl [the nutritionist] was not there… I could not ask her about what I could change" (C27-ow)
>
> "What worked for me was to eat every 2 hours… but I got bored… with that I lost 7-8 kilograms… but I got tired of it… I got tired of eating those crackers... (S12-ob)

Second, the perception of a healthy diet being more expensive, along with the fact that the participants have a tight budget, were also mentioned as obstacles by both the OB and the OW groups.

"…because with diets you always have to eat 2 or 3 fruits per day, and I do not have [money] to buy fruits, so I cannot follow the diet…" (B54-ow)

"Because she [the nutritionist] told me, 'Buy turkey and everything light', and really, looking at my pocket [budget]… I cannot buy everything light, because if I give priority to low fat cheese, to turkey… I am not going to have money for other stuff." (D7-ob)

Third, the lack of social support, especially from their families, was also indicated by OW and OB participants.

"I want to make a habit of eating [healthier], but the schedules are difficult… the girls [her daughters] are sometimes hungry and they tell me to make something [to eat], and they make me eat…" (L16-ow)

Interviewer: "What are the most difficult foods to stop eating for you?"

C13-ob: "Pasta… bread… because they [her family] are not going to stop eating it [bread], I mean my husband…he is not going to eat whole wheat bread or pita bread"

Finally, it was difficult for OW and OB participants to accept the change of adopting new behaviors that deviated from their usual routine, especially those behaviors that some participants mentioned that they have had since they were children.

Interviewer: "What was the most difficult part? [of following the dietary recommendation]"

MI32-ow: "Having to stop eating bread… because I cannot eat half of a piece of bread for breakfast and half for tea time… Now, I eat a whole piece [each time]"

Interviewer: "Why do you think that you cannot achieve the right diet?"

B52-ob: “Because we usually eat anytime, at no regular intervals [in relation to the time in which they ate]”

Four important barriers for healthy eating were identified in obese and overweight participants: “the perception of healthier food as boring,” “the perception that healthier food is more expensive,” “the perceived lack of social support from family members,” and “the difficulty of changing behaviors that they have had their entire lives.”

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NORMAL WEIGHT WOMEN

Theme 14: “I do not have time…” (Perceptions of Lack of Time)

Eighty percent of the NW participants mentioned that they did not have enough time to prepare elaborated meals. They stated that with all of the housework and other activities that they had to do, they bought, cooked, and ate food that was easy and quick to prepare. They perceived that they lacked the time to dedicate themselves in the kitchen. They mentioned that sometimes they eat doing other activities at the same time, or eat fast.

“Interviewer: Why do you always have tortillas?

P1-n: “Because they cook easily, they are different, and they are fast and light.”

“When I am in a hurry, I eat this (Image 4.21)… Can you recognize it? A piece of fried meat with a glass of juice and bread… I have so much to do during the day. For example, this (Image) was my lunch; I did not have time to cook [something else]” (V22-n)

Image 4.21, Not Titled

In summary, seven new themes were found when analyzing the interviews by group. Five new themes were unique for obese participants, “psychological and emotional status,” “health condition,” “physical appearance,” “failed past experiences,” and “gender roles.” One theme was found in overweight and obese participants, “perceptions and obstacles to eat healthier.” Finally, “lack of time” was a theme found in the normal weight group only.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

5.1 Discussion

The current exploratory and participatory study was conducted with a group of Chilean women living in urban areas of Santiago (Chile). Photo-elicitation was used as an innovative technique to elicit information from the participants. All participants were from low SES and were living in neighborhoods considered socially vulnerable. Due to the fact that the prevalence of obesity is higher in women, especially in women from low SES backgrounds (Ministerio de Salud de Chile, 2010), this study intended to look for some clues that will allow researchers to understand why this situation happens. In this way, this study contributes to the understanding of eating behaviors in adult women of low SES backgrounds in Chile, also expanding the literature in the field in Latin America, which is an area that is currently lacking information. Using qualitative methods as a base, the inclusion of a mixed methods approach in part of the analysis, as well as participatory techniques, the current research examined why these women ate the way that they did.

This study expands to analyze similarities and differences of variables that influenced the Chilean women's diets according to their nutritional status: normal weight, overweight, and obese women. To our knowledge, just one previous study has researched food choice in women with different nutritional statuses (Dressler & Smith, 2013a). In this study, the author studied two groups, overweight/obese and normal weight women, and as a conclusion, they established that there is a need to understand what happens with the food choice differentiated by nutritional status. Therefore, the current research fills this gap in the literature and provides information that

goes beyond the study of just the calories and nutrient intake among the three groups (normal weight, overweight, and obese). Furthermore, this study can help researchers and inform health care providers to understand the behaviors that women have and establish a better way to help them reach their goal of having a healthy diet. All participants in our study had a similar SES background (Table 4.2), which allowed us to analyze in a more specific manner the different influences that affect their diets; without the interference of major social variables.

This study focused on three main eating behaviors that we called the pillars of our study: the purchasing of food, the cooking process, and the intake of food. These behaviors were obtained from the narratives of the participants who talked more than just about their intake of food. Even when participants spoke about the pictures that involved more meals or people eating, they were also able to talk about purchasing or cooking food. Unlike other studies that only focus on the intake of certain foods or food choice, this study sought for variety of influences of specific eating behaviors that precede the intake of food (see Figure 4.1). It must be noted that the participants defined these behaviors in their narratives, which we gathered in an inductive analysis and used them as the basis for our model of influences (Figure 4.1 and 4.2). In other studies, the behaviors being researched were decided by the investigators. For instance, Johnson, Sharkey, & Dean (2011) indicated in their methods section that their study protocol investigated food choice as defined by “grocery shopping, cooking, and eating” (p.43). In our study, we did not have a previous scheme of the specific behaviors that we were going to look for. It was the participants who told us what behaviors we had to focus on.

Previous studies about women from low SES backgrounds have addressed some of the behaviors that we found, but when these studies show the results, they talk about general food choice or intake of food, losing the information about what is influencing the other specific

behaviors. For example, Inglis et al. (2005) indicated that they investigated women's eating behaviors based mainly on what they ate (intake of food as specific behaviors), such as the consumption of fruits and vegetables, and fast food. However, some information about the purchasing of food was also mentioned in the results section (Inglis et al., 2005). In the Johnson, Sharkey, & Dean (2011)'s study, despite the fact that they indicate on methods section about what behaviors they were investigating, in the results section, the authors talk about food choice and eating practices without any specification of the previously defined behaviors they were referring to in the method section.

In this study, we found seven themes that influenced participants' eating behaviors when all interviews were analyzed together. These themes were: "Family", "Preferences", "Temporality", "Financial issues", "Special Occasion ", "Perceptions about food", and "Food availability". These themes affected the three pillar of behaviors studied in different ways. We developed a model of how these themes influenced the three eating behaviors studied, but at the same time how the themes identified, especially family, influenced one another (Figure 4.2). We did not find a model similar to ours in the literature. Most existing models try to explain eating behavior in a broader way. For example, the Theory of Planned Behavior (Ajzen, 1991) involves a conceptual model that can explain eating behaviors in general, but it also can be used on other several health behaviors. Similarly, Verstraeten et al. (2014) generate a conceptual model to explain eating behavior as general, in adolescents. Our model represents a framework to study eating behaviors in Chilean women from low SES backgrounds, which could inform health planners to create new interventions focusing on the relationships between the identified themes and eating behaviors.

Among the seven themes found, family was the most influential. As it is shown in Figure 4.2; “family” was mentioned when shopping for food, cooking and food consumption. The first reason that demonstrated the importance of family on eating behaviors was the fact that it was difficult to separate what participants said about their own diets from their families’ diet. Participants tended to answer with the word “we” when they were asked about their own eating patterns. This fact illustrates the concept of *familism* that appears in Latin American culture literature. This concept refers to the importance that family has for Latin Americans, and how strong the links between family members can be (Katiria Perez & Cruess, 2014). In our research, it seems that participants have strong ties with their family members, which made it more difficult for them to answer for themselves. In addition, studies about *familism* and eating behaviors have shown positive and negative effects for individuals. Among the positive effects is that family members tend to have more meals together (Page, 2004). On the other hand, other studies indicated that high levels of cohesion among family members could be related to unhealthier diets (Chesla et al., 2003; Mellin, Neumark-Sztainer, Patterson, & Sockalosky, 2004). Both kinds of effects were also mentioned by our participants.

Among family, partners and children seemed to have the greatest influence on the participants’ decision-making process. Likewise, Barker, Lawrence, Skinner, et al. (2008) found that partners and children have a higher level of control over what was bought and prepared. Keller, Fleury, & Rivera (2007), in a study also using photo-elicitation, explain how women changed their eating behaviors when their husbands or children were not with them. Some of them indicated that they eat unhealthier when their family members were not there, and others mentioned that they took more care of their weight (Keller et al., 2007). Previous studies have shown how children influence the eating behaviors of women from low SES backgrounds.

Johnson, Sharkey, & Dean (2011) found three themes in food choices of Latino mothers from low SES backgrounds: Children are the priority for mothers, mothers are always looking for the best for their children, and mothers always want their children to be happy, healthy and fed. Similarly, Johnson, Sharkey, Dean, et al. (2011) pointed out how their participants connected their role as mother with their diet and their identities. Another study found a similar finding that was brought up in our study, which is that participants indicated that they prioritized their children's happiness over their own, sometimes having to eat what their children wanted over what they wanted to eat (Johnson, Sharkey, Dean, et al., 2011). Inglis et al. (2005) also indicated that women in their study prepare meals that their kids wanted. All these facts mentioned above support the fact that a woman's role as a mothers is stronger than her role as woman in our society, especially in the Chilean context, which has also been described previously in Latin American literature (Pinto & Coltrane, 2009). On the other hand, the influence that a husband or partner has on women's eating behaviors has been studied less. Research related to the influence of a husband/partner is primarily associated with the social support that he can give his wife/partner to follow certain behaviors (Ball et al., 2007; Inglis et al., 2005; Smith-Dijulio et al., 2010). In our study, husbands were seen as people who limited the possibility of the participants' ability to eat healthier due to the fact that they brought extra food home or because, despite the fact that participants wanted to eat more fruits and vegetables, they could not do so because their husbands were not going to eat those meals. A similar situation was found by Inglis et al. (2005) who describe that "a partner's choice of what to cook was often seen as a barrier to healthy eating among women of low and mid-SES" (p. 338). Women from low SES backgrounds mentioned partners more as a factor that hindered their food choice, whereas children were the major factor for high SES participants in Inglis et al.'s (2005) study. This importance of the

family could also be seen in the amount of pictures that the participants took which featured men and children. Although, we cannot assume who the people in the photos are for sure, there is a high probability that those who appear in the pictures are their family.

Participants from our study demonstrated extensive knowledge of their husband's/partner's and children's eating patterns; they knew how their families ate and were aware of their tastes and preferences. Participants most likely acquired this knowledge from their experience of preparing every meal for their families. All participants, despite the fact that some of them worked outside of the home, were in charge of the family meals in their respective homes, further supporting the important role of women in the formation of family eating habits. To our knowledge, few studies have focused on mothers' knowledge about their children eating behaviors (Coveney, 2007; Lee et al., 2008), but no other study, has addressed the high level of knowledge that women have about their partners' diets. This high level of knowledge displayed by participants can have both positive and negative sides when intervening in this population. The knowledge about family preferences could be a barrier that health care providers would face when trying to promote healthy diets, as it was mentioned previously. But, on the other hand, as this high knowledge level further supports the important role of women in the formation of family eating habits, women could become an important entry point when working with the diets of other family members.

In the analysis by nutritional status group, some tendencies could be observed. For example, the obese and the overweight groups tended to speak about their families more during the conversation (5 times more in the obese group and 3 times more in the overweight groups; Table 4.3), and more patterns were found in their discourses about this theme that in the normal weight group (Table 4.4). Our overweight and obese participants cooked, ate or bought food

based on the wants and needs of others. This could mean that overweight and obese women could be more dependent on others when it was time to decide on their own diets, or that they also thought more about their family members than normal weight participants. This idea is supported by another study that looked at U.S. African American obese women who also indicated that families were important for them when thinking about food. In fact, the authors pointed out that that these participants believed that time spent with their family was more important than eating healthy (Befort et al., 2008). This can also be observed when our overweight or obese participants mentioned that some of the food that they ate (which was not always healthy) was due to a special family moment, demonstrating that time with family was given priority over health. The family issues mentioned above are factors that influence the eating behaviors of women and should not be ignored when they seek treatment for losing weight. It seems that our participants lack the power to make decisions about their own diet, and they lack support from their family members, which is a trend found in overweight and obese women (Zhixian Sui, Turnbull, & Dodd, 2013). Interventions that include the whole family could be more effective to help change the eating behaviors of women who are overweight or obese, which can ultimately result in weight loss. It must be noted that there is evidence that family support can affect other health behaviors (Baranowski, Nader, Dunn, & Vanderpool, 1981; Donohue et al., 2009; Sperry, 2006; Tyler & Horner, 2008), but there has only been one study published in which family has been incorporated into the treatment of women with obesity, showing favorable outcomes (Cousins et al., 1992). Most of the literature about family and eating behaviors has focused on children (Kitzmann & Beech, 2006; Salminen, Vahlberg, & Ojanlatva, 2005; Sung-Chan, Sung, Zhao, & Brownson, 2013). More research is needed in order

to understand how family members can be incorporated into the prevention or treatment of the problem of obesity in women.

A second theme was the "preferences" for taste, texture, and other food related partialities. This theme mostly influenced how participants cooked food, and what kind of food they ate. Several studies have shown how preferences directly influence food intake. We did not find others studies in which the cooking process was specifically studied; however, it is possible that this behavior have been included when the authors talk about diet in general. A previous study in Chile with a similar group of participants, found that preferences were one of the most important variables that determined women's diets (Galvez et al., 2015). In this study, health care providers also agreed that preferences were important and claimed that women eat certain food "simply because they like them" (Galvez et al., 2015, p.4). Inglis et al. (2005) also found that preferences influenced women's eating behaviors independent of their SES backgrounds. Unlike our study, in Inglis et al.'s (2005) study, participants' preferences determined food purchasing decisions. Others studies also have shown the relationship between intake and women's preferences. For example, in young women, a 32% of the variance of the frequency in which a food was consumed was due to the food preferences (Drewnowski & Hann, 1999). Another study about women showed that preferences for fruits and vegetables were associated with the consumption of those two foods (Williams et al., 2012).

"Family" was influencing the participants' preferences directly. They mentioned that sometimes they had to go against their preferences due to their family. But, they also indicated that they sometimes maintained their preferences, although their family did not agree with them. Previous studies have demonstrated that women tend to put their preferences below the preferences of their family members, especially those of their children (Lupton, 2000; Santich,

1995). This reinforces the idea that a woman's primary role is that of a mother, where the preferences of her children and her partner are valued more than her own (Johnson, Sharkey, Dean, et al., 2011; Pinto & Coltrane, 2009).

Although, there were no differences between the nutritional status groups in relation to preferences, it is important to note that obese participants tended to have a stronger relationship with food due to the fact that they expressed that they "love" some food, which was not a phrase used by normal weight or overweight participants. Several studies have demonstrated that obese or overweight individuals make their food choice based on their preferences (See for example DiSantis, Hillier, Holaday, & Kumanyika, 2016; Dressler & Smith, 2013; Reyes, Klotz, & Herring, 2013), but we did not find any study that demonstrated a stronger relationship between obese participants and food. In Dressler & Smith's (2013) study, one of their participants with obesity indicated that no matter the price of a certain food, she still bought it due to the taste. It is probably this type of relationship with food that makes it difficult for obese women to change some eating behaviors. In this same study conducted by Dressler & Smith (2013), similarities between women's preferences with different nutritional status were also found.

The third theme found was "temporality", which was related to the day of the week or the season of the year as factors that affected food behaviors. "Temporality" influenced the purchasing of food, the cooking process, and the intake of food. First, participants indicated that they ate differently during the weekends. They indicated that during the weekend they ate more or 'special' food. In this aspect of temporality, family exerts a direct effect on eating behaviors because participants said that it was during the weekend that they had the opportunity to spend time with other family members. We found one study relate to the variation of diet during the week. This study was conducted with children who ate more calories from fat, fewer fruits and

vegetables, and sweetened drinks on weekends (Hart, Raynor, Osterholt, Jelalian, & Wing, 2011). The authors also indicated that these changes could be due to the fact that during the weekend there was a less structured routine as well as an increased availability of food at home, which could cause unhealthier eating habits (Hart et al., 2011). Something similar could be suggested with the participants in our study who indicate that during the weekend they strayed from their routines, and ate different foods. Although, the calorie and nutrient intake during weekdays were not evaluated, from what participants expressed during their interviews, it is possible that they had an increase in calories, fat and sugar during the weekend, as was observed in Hart et al.'s (2011) study.

Second, participants mentioned that they changed their behaviors during the year. These changes were mentioned to happen between summer and winter. Few studies have been conducted on the seasonal effect on diet. Joachim (1997), in a study of the influence of the weather over diet, implemented a questionnaire in a group of men and women aged 25-50 years and found that from a list of 117 foods, 105 presented changes in consumption between summer and winter. For example, it was found that there was an increase in the consumption of hot cereals in the winter and fruits in the summer. Another study found some differences between nutrient consumption between winter and spring, as well as a change in body weight between winter and summer; where higher changes were observed in men (Ma et al., 2006). Prasad et al. (2010), when studying a group of women, observed that the main seasonal effect on eating behaviors occurred in the daily consumption of vegetables, fruits, and cereals. Moreover, nutrient variations were also found (Prasad et al., 2010). In our study, participants expressed that they ate differently mainly between summer and winter. This difference was explained due to two reasons. First, the environmental temperature during these seasons caused one to eat less or more

raw food. They said that during the winter, they ate less raw food because these foods made them got cold. The second reason was due to the availability of food. In Chile, it easy to see that during the summer the availability and variety of certain kinds of foods, such as fruits, increases, while during the winter the variety is greatly reduced (Fundacion Chile Vive Sano, n.d). Prasad et al. (2010) also suggest the availability of food in the market, as well as the variation of food prices, as reasons for changes in eating behaviors in the women studied. Food prices were mentioned by a few participants in our study as a reason that they had to change their eating behaviors during a specific season. In Chile, there are no studies that have been done about the seasonal effects on dietary consumption; however, since the seasons are so distinct, it is necessary to research this issue further in order to review and improve the current food policies that currently exist in the country.

Although there were three common patterns related to temporality that appeared in all three groups, this theme seemed to affect overweight and obese participants more than normal weight participants. Once again, family was the aspect that overweight and obese participants mention in regard to weekends, highlighting its importance in their daily lives. In addition, these two groups of participants mentioned that their fruit and vegetable consumption changed during the year, especially during the winter. This could be associated with another pattern that appeared in these groups (but was also in the normal weight group), which is that the environmental temperature affected the food that they ate; but many participants also did not know a lot of recipes that included fruits and vegetables. These patterns can put women who are overweight and obese more at risk during the winter, making them prefer other kinds of food, which they attribute to allowing them to get warm and are more related to high energy-dense foods. This could be proved by the fact that some of the obese participants mentioned that they

gain weight during the winter. This last point can be added to the fact that the weather has been seen as a barrier to perform physical activity (Zhixian Sui et al., 2013), and some evidence shows that overweight people effectively reduce their physical activity during winter (Ma et al., 2006). These factors that are associated with temporality allows us to think about how to better address the treatment of obese and overweight women, as well as, what measures to take for normal weight women in order to promote healthy eating habits year round.

"Financial issues" was another theme that influenced the food purchasing process. This was related to the limited budget that women had, the price of food, and other economic needs of the participants. All women in this study were from low SES backgrounds, and it is known that low SES individuals are more likely to have a lower income and a lower budget than other socioeconomic groups, making it more difficult to satisfy their needs (Barker, Lawrence, Woadden, et al., 2008). Therefore, it is not rare that in our study, participants complained about the lack of money for buying all the foods that they needed. Barker, Lawrence, Woadden, et al., (2008) pointed out that having a restricted budget makes food choice a lower priority than other demands that people have. A limited budget also reduces the options that people can select, which could make food intake less enjoyable (Barker, Lawrence, Woadden, et al., 2008). Inglis, Ball, & Crawford (2009) discussed how women from low SES backgrounds have strategies when making a budget. Among these strategies are, to buy in bulk, purchase only fruits and vegetables according to the season, look for special promotions in supermarkets, buy generic brands, and buy food that is almost expired or expired. In the current research, our participants also used some of these strategies to take care of their budget. In another previous study, Inglis et al. (2005) also pointed out the cost of food, particularly the cost of healthy food, an aspect that women considered at the moment of purchasing food. Financial issues was also indicated as a

barrier to eat healthier for disadvantaged women in the Williams et al. (2010)'s research. Barker, Lawrence, Skinner, et al. (2008) observed that food choices by women from low SES backgrounds were extremely dependent on the cost of food, but also due to the need to not waste any money. In contrast, Inglis et al. (2009) found that when women from low SES backgrounds had a better budget, they still selected a bigger proportion of unhealthy foods, suggesting that there could be others factors, aside from cost, that could be influencing choice. Therefore, policies that control the prices of food (making healthier food cheaper and less healthy food more expensive) could be a good strategy to help people from low SES backgrounds have access to healthy foods.

In our study, participants mentioned that they selected the place in which they bought their food according to the price. They usually select the places where food is cheaper, such as the farmer's market. The way that most of our participants managed their food budget was via their ability to make the decision about where to buy their food. In this way, as women in Barker, Lawrence, Skinner, et al.'s (2008) study, they tried to avoid wasting money at expensive places. All of the strategies described coincides with the economic theory that indicates that when a budget is limited, particularly for people from low SES backgrounds, individuals try to maximize what they spend on food by getting food that have more calories in the most economical manner possible (Drewnowski & Specter, 2004).

The "financial issues" theme worked differently in each group. In fact, there was a tendency for obese participants to talk more about it during their interviews. In addition, as in previous cases, overweight and obese women tended to have more qualitative patterns related to financial issues than normal weight participants (Table 4.4). This is in line with what was found by Dressler & Smith (2013), who indicate that overweight or obese women talked more about

cost and other financial issues than normal weight women. There was only one common pattern that was found in the three groups that was related to who was in charge of the budget. Normal weight and overweight participants mentioned that they restrained from eating certain foods because of money, foods that sometimes were healthier, such as fish. Other studies have also found that when a budget is limited, healthier food tended to be taken out of the food budget (Drewnowski & Specter, 2004; Giskes, Turrell, Patterson, & Newman, 2002), but it is not clear if an individual's nutritional status can also affect this trend. In normal weight and overweight participants, it was found that they looked for strategies to save money. This situation is common among overweight/obese women, but is not as common among normal weight women (Dressler & Smith, 2013a). For example, Sui et al. (2013) suggest that obese and overweight individuals prefer to buy seasonal food since they are cheaper. Dressler & Smith (2013) also indicated that independent of BMI, women from low SES backgrounds eat at free meals sites and use food banks, especially when their budget is getting low. An insufficient budget or perceiving their budget or money as barriers to eating healthier were trends mentioned by overweight and obese participants. Obese participants also mentioned that some fruits and vegetables, as well as certain meats, were more expensive, not allowing them to purchase them. In general, proteins have been considered as more expensive than fats and carbs (Brooke, Simpson, & Raubenheimer, 2010), and for this reason, it is possible that obese women from lower SES backgrounds prefer to buy cheaper foods, such as pasta or rice, rather than proteins (Hruschka, 2012). Moreover, Hruschka (2012) claimed, "economic deprivation leads to food choices which paradoxically cause households and consumers to overconsume and thus to deposit greater quantities of fat" (p. 279). Health providers should be aware of the relationship between obesity and poverty in order to educate obese and overweight women about how to eat healthier on a limited budget. Once

again, it must be noted that policies that control the prices of healthy and unhealthy food contribute to the behaviors mentioned above, which affect women from low SES backgrounds.

The fifth theme that was cited by our participants are dates that represent a symbol ("Special Occasions ") for them, such as Christmas, New Year's Eve, birthday parties, among others. These "special occasions" were pointed out as a variable that influenced the intake of food, but also the way in which women prepared the food. Special food or special recipes were used for these moments (e.g., barbecues and cakes). Fox (n.d.) refers to this association of food and special occasions as the role of food as a ritual, which is part of each culture. It is during these special occasions that food has an important role, giving individuals an excuse to eat high-dense food or low-nutrient food (Isoldi & Dalton, 2012). For example, in our study, participants said that during these special occasions, they ate cakes, drank more soda or alcohol, and had other food with a high amount of sugar and fat. Little research has been done in this matter, but several dietary guidelines recognize these special occasions, especially when these events mean eating out, an important situation when eating behaviors can change (American Diabetes Association, 2016; Center for Disease Control and Prevention, 2016; U.S. Department of Agriculture, 2015). This point makes us think about the incorporation of "*healthy parties*" in the Chilean Dietary Guideline. As observed in Figure 4.2, the family also influences special occasions because on these dates participants spent time with other family members. There were differences found among normal weight, overweight, and obese participants for this theme.

The "perceptions of some food characteristics" mainly influenced what participants ate. Knowledge of food properties, or holding a negative opinion of the quality of a food, resulted in participants selecting a certain kind of food over others. Research in this area has mainly focused on knowledge about food and nutrition due to the role that this knowledge has on eating healthier

(De Vriendt et al., 2009; Greaney et al., 2012; Williams et al., 2010). It has been found that individuals from low SES backgrounds have a tendency to have less nutritional knowledge than those from other SES groups (Guillaumie, Godin, & Vezina-Im, 2010; Parmenter, Waller, & Wardle, 2000). In our study, participants demonstrated some knowledge about nutrient content or health properties that made them eat more or less of certain foods. In addition, our participants were able to talk about the relationship between the nutrition content of some foods and certain health diseases. The knowledge that women have can directly influence their perceptions about food and what they eat. Williams et al. (2010) show that women from low SES backgrounds who know more about food and nutrition, eat more fruits and vegetables. Rustad and Smith (2013) showed that after an intervention that increased the nutrition knowledge of women, there was an increase in their vegetable consumption, and a decrease in their consumption of fast food, processed food, and other high-fat content food. Despite, our participants' knowledge about the fat or sugar content of certain foods, they stated that they still ate them, illustrating that nutrition knowledge does not always lead to behavioral changes.

We did not find big differences between the normal weight, overweight, and obese groups from a quantitative point of view, but from a qualitative analysis, differences between the groups could be observed. More normal weight and overweight participants mentioned more food perceptions in which they demonstrated to have more nutrition knowledge than obese participants. It was noteworthy that normal weight and overweight participants were able to talk about specific nutrients or health properties of certain foods. Previous studies have advocated that there is a positive relationship between the degree of nutritional knowledge and the BMI (Nti, Hayford, & Opare-Obisaw, 2012), suggesting that normal weight women would have more knowledge than obese women. In our study, it seems that normal weight and even overweight

participants were able to talk about their nutritional knowledge. In contrast, obese women mentioned more myths or incorrect beliefs about food. Furthermore, obese and overweight participants indicated more foods that they considered “essential” or that they see as “enemies”. Participants stated that certain foods needed to be in their homes due to their families’ need. This strong relationship with food appears more in participants that have a BMI higher than the normal. The essential foods mentioned usually were high in carbs or calories, which can contribute to their condition of being overweight and obese. In addition, some of the foods that overweight and obese participants consumed were also considered as enemies, especially in relationship to their weight. It is interesting to note that these participants knew about which foods were more related to weight gain, and as such, they restrained themselves from them. This could be due to the fact that these participants are more likely to be dieting (Anderson, Eyler, Galuska, Brown, & Brownson, 2002) and as such, they have been exposed to nutritional recommendations.

The last theme found in the whole group was the “availability of food” in their neighborhoods and homes. This influenced what women bought and ate (Figure 4.1). There have been other studies in which the availability of food in a neighborhood affects the intake of food. For example, some studies indicate that living in a low SES neighborhood can reduce one’s intake of fruit and vegetables, and can increase one’s intake of fast food (Diez-Roux et al., 1999; Jeffery, Baxter, McGuire, & Linde, 2006). However, there are also other studies that show no relationship between these factors (Pearson, Russell, Campbell, & Barker, 2005; White, Bunting, Williams, Raybould, & Adamson, 2004). Participants in our study evaluated their neighborhoods as places where food was readily available. Inglis et al. (2005) found similar results when discussing the availability of food with women, although SES did not prove to be influential

when analyzing the answers given. Authors indicated that women were satisfied the availability and quality, particularly of healthy food. This contrasts with some perceptions about the lower availability of food in low SE neighborhoods in some countries (Kimoto et al., 2014).

Furthermore, this last idea has been reinforced by studies which say that in some low SES neighborhoods it is impossible to find any store where people can buy food (Olendzki et al., 2015), which is not the case in Chile. In Chile, there are no studies that show the availability of food by looking at the number of small grocery stores, farmer's markets or supermarkets in a particular area; but, it is known that small grocery stores can be found on almost every corner, and that farmer's markets and supermarkets contribute daily to supply the needs of most of the Chilean population (Observatorio Feria Libre, 2013; Publimetro, 2014; Supermercados de Chile A. G., n.d.).

Although, participants evaluated their communities as having good food availability, they also recognized that the grocery stores closer to their homes (called *almacenes de barrio* in Chile) tended to be more expensive and have less variety of fruits and vegetables. Olendzki et al. (2015) also found that food stores in low SES urban and suburban communities, have a low variety of healthy food. For this reason, our participants preferred to shop at places a bit further from their homes, such as farmer's markets or supermarkets. In general, our participants selected farmer's markets as the places to buy fruits and vegetables, because they are cheaper and have a large variety of fruits and vegetables (as can be observed in some of the pictures that participants took). They preferred supermarkets to buy others foods, such as cereals, dairy products or anything that they could not find at the farmer's market. In Williams et al.'s (2010) study, it was also found that some participants preferred to do their grocery shopping outside of their local

area to find better quality and variety. Laska, Graham, Moe, & Van Riper (2010) showed that individuals traveled an average of 3.1 miles from home to do their grocery shopping.

Participants in our study also highlighted the high availability of unhealthy food over healthy food in their neighborhood. Olendzki et al. (2015) described similar results in their study of food availability in central Massachusetts. The authors indicated that unhealthy foods were more widely available than the healthier ones. In fact, they discussed how stores had plenty of unhealthy food and almost no or just a few options for healthy food (Olendzki et al., 2015). This higher availability of unhealthy food, that is often cheaper than healthy food, can put the low SES population at risk. Therefore, more policies are needed to control the sale of healthy and unhealthy foods in the country.

Finally, participants pointed out that if they had food available at home, there was a higher probability that they ate that food. The home has been the focus of several interventions in regard to the importance of food intake of individuals (Rosenkranz & Dzewaltowski, 2008). Studies have revealed that the high availability of fat at home caused a higher consumption of fat; a comparable situation is found for fruits and vegetables (Kegler et al., 2014). In the current research, there was no measure of food availability at home, however, some participants said that when they have certain foods at home, for example, the food that they bought for their children, they ate those foods more frequently. In general, these foods were high in calories and sugar, such cookies, juices, among others. Additionally, through the conversations with the participants, it was easy to establish that pasta and rice (which are high in carbs) were staples in every home. This idea was further supported by the fact that some participants took pictures of these food and titled them as "*essential food.*"

The availability theme behaved similarly in the three nutritional status groups. Most overweight participants talked about how they ate more of a certain food if it was available at home. The problem is, that sometimes this easily available food is not healthy, as was described by Gorin, Phelan, Raynor, & Wing (2011). Using a group of overweight adults, the authors note that these participants had less fruits and vegetables and more snacks with a high amount of fat than normal weight participants. This causes us to think that interventions in the home are necessary in order to help overweight women learn how to organize food, which would ultimately prevent weight gain.

When we searched for other themes in each nutritional status group, seven new ones were observed. Most of them were found in the obese group. One of the first theme found in the obese group of participants was they had an emotional or psychological condition, such as anxiety. This is in line with what was found by Lazarevich, Irigoyen-Camacho, & Velázquez-Alva (2013) in an earlier study which showed that obese people tended to have more depression symptoms. Furthermore, in a previous study examining Chilean women, health care providers that worked with these women, stated that most of them had a psychological problem that was registered in clinical reports, but that this was not associated with a specific nutritional status (Galvez et al., 2015). Our participants were able to describe their anxiety in relation to food, and this together with other sensations, such as lack of control, caused them to eat more, especially when there was some emotion involved. Emotional eating has been associated previously with obese women, and at the same time with self-control (Annesi & Mareno, 2015). Self-control has been considered a predictor of healthy eating (Sproesser, Strohbach, Schupp, & Renner, 2011). Women who are obese or overweight have indicated that they used food as a coping strategy to

overcome periods of depression or stress (Dressler & Smith, 2013a), but the foods selected during these periods are high-density foods (Sproesser et al., 2011). On the other hand, normal weight women mentioned that they did not change their eating behavior or even, ate less during moments of stress (Dressler & Smith, 2013a). It is possible that our participants with obesity could be unable to change some of their behaviors due to this sensation of anxiety that makes them lose the control over what they are eating. Moreover, it is possible that due to several factors, such as financial issues or the constant pressure from society to lose weight, that the obese participants felt more stressed and once again felt anxiety, causing them to eat more. If we add this factor to the fact that they have little control over what they eat at home since their families need come first, it seems that these women are in a difficult scenario to obtain self-efficacy to improve their weight and overall health.

Another theme that the obese group pointed out was the "presence of an illness" that affected them or one of their family members. This is related to the fact that most of these participants also have a chronic disease, such as diabetes or hypertension, with a treatment that has changed their eating behaviors. Similar findings were observed by Dressler & Smith (2013) who indicated that a few women in their study with overweight or obesity mentioned having some disease or that a member of their family had a disease, that made them think about their diet. The authors concluded that overweight and obese women tended to be more reactive than preventive. On the other hand, women with normal weight mentioned that the relationship between weight and health, cause them to make healthy decisions related to food (Dressler & Smith, 2013a). Nonetheless, we realized that our participants knew how to eat to take care of their disease.

Additionally, the obese group described that their physical appearance influenced the way that they ate. Living in an environment surrounded by messages about the negative aspects of being overweight or obese, from health to aesthetics (Browne, 2012), we can observe a vicious circle with the aesthetic aspect for our participants. Obese participants felt uncomfortable with their bodies, which generated sadness, anxiety, and low self-esteem (Puhl & Brownell, 2006), mental situations that caused them to eat more and gain more weight (as discussed above). This paradoxical situation has also been explored by Shentow-Bewsh, Keating, & Mills (2016). These authors talk about the escape theory ("overeating can result from a desire to escape from an unpleasant self-image" [Shentow-Bewsh et al., 2016, p. 48]) as a possible explanation of the obesity stigmatization and its effects on mental health, which can result in overeating. Again, the mental health of participants seems to be another important factor in the treatment of obesity in women.

Most of the obese participants expressed that they had made some changes in their eating behaviors in the past, but because they did not see quick results or the results that they wanted ("past failed experiences"), they gave up and returned to their previous behaviors. This desire to have quick results can create more challenges for obese women when they do not obtain them, which can result in low self-esteem, low self-control, low self-efficacy, and at the same time, more dependence on others' food choices. For these reasons, it is also probable that this group of women give up easily when they fail in their intent to lose weight. It is necessary that these obese women receive attention from a health care provider, especially nutritionists that can help guide them on how to lose weight in a healthy way.

The last theme that appeared strongly in the obese group was their role in the society, particularly as a wife ("gender roles"). As wives, their role was to serve to their husband, not

only in regards to appealing to their food preferences (as mentioned above), but also in the act of waiting on him. In most countries, it has been observed that between adult populations, the prevalence of obesity is higher in women than men (Finucane et al., 2011; Garawi, Devries, Thorogood, & Uauy, 2014). However, only a few studies have associated this situation to gender issues (Garawi et al., 2014). Garawi et al. (2014) suggested that women and men are exposed to the same physical and food environments, but the interaction that they have with them is different due to their gender roles. It is probable that our society is making women think more about others than about themselves, resulting in the fact that they do not take care of their weight and ultimately, their overall health. For example, in many cultures it has been found that women are the people in charge of taking care of others (Acheampong & Haldeman, 2013). In the same sense, since most of our obese participants were housewives, who did not work outside of the home, it is possible that they thought that the way they contributed to their families was by serving their husbands and taking care of others.

Obese and overweight participants perceived several "difficulties or obstacles to maintain a healthy diet". These barriers most likely appear in these groups because these participants tended to diet more frequently than normal weight participants (Dressler & Smith, 2013a), and as such, they were exposed to more difficulties when attempting to change their eating behaviors. One of these barriers was that they got bored of dieting. This boredom is linked to the lack of knowledge about what other ingredients or foods could be added to their diet. This makes us question the structure of the treatments given to patients to reduce weight in Chile. Although boredom was mentioned as a factor that lead to a failed diet, it has also been described as affecting other aspects of women's lives. Hayman, Lee, Miller, & Lumeng (2014) found that when women got bored, they ate more. The authors indicated that this kind of eating (called

bored-eating) causes women eat whatever they have on hand, and it something that can happen every day. However, this was not related to a particular nutritional status or race (Hayman et al., 2014). Even, Dressler & Smith (2013) found that overweight and obese women used food as a means to help with boredom.

Overweight and obese participants also highlighted the price of healthy food as a barrier to eat healthier. This is something that has been mentioned before among women from low socioeconomic backgrounds in general (Inglis et al., 2005). In the same way, Williams et al. (2010) stated that women with lower perceptions about the cost of healthy food were associated with higher consumption of fruits, which was also found by Barker, Lawrence, Skinner, et al. (2008). Dressler & Smith (2013) also exposed this situation with overweight and obese women. Chang, Baumann, Nitzke, & Brown (2005) declared that cost was one of the most important factors in the selection of healthy food by obese women, while weight control was less important. There is evidence that there could be some misconceptions about the cost of healthy food, but this is also dependent on the country in which these perceptions are studied (Cade, Upmeier, Calvert, & Greenwood, 1999). Some of the conceptions and misconceptions that our participants had are related to sources of information that not always are trustworthy, such as the television, the internet or someone near to them.

The third difficulty for eating healthier was related with the social support from their families. This was related to how participants' preferences could not be maintained or competed with those of their families. Finally, changing behaviors that they were used to was the last barrier that they mentioned. This last point represents a factor that points to why eating behaviors are so complex. There are some behaviors that we have done for so many years, that in order to change them, even when it is necessary for our health, it proves very difficult. Using health

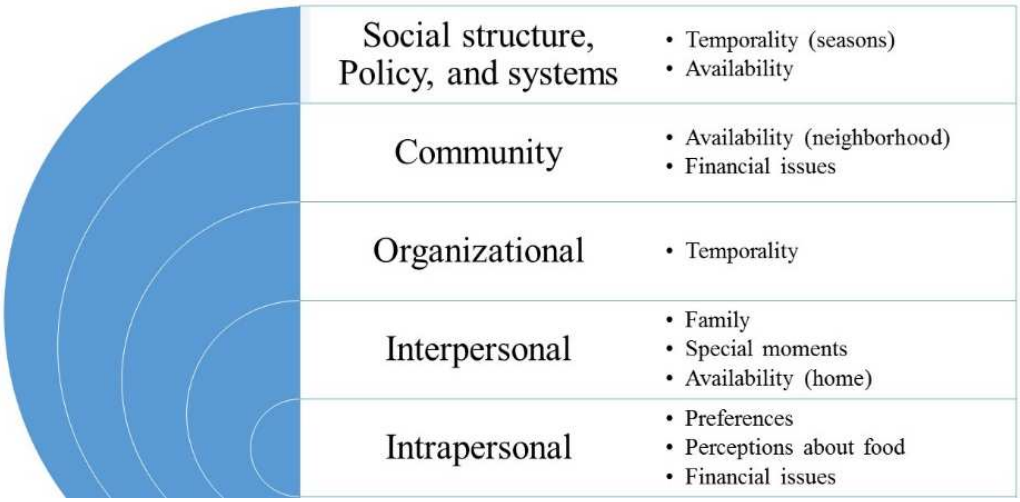
behavior theories, such as the Transtheoretical Model explains (Prochaska, Jonhson, & Lee, 2009), can provide a strategy to help people to change these habits.

The last new theme found was related to the "perception of the lack of time", which was discussed by mostly normal weight participants. Normal weight participants said that they had so many things to do on a daily basis that they opted for meals that were easier to prepare, such as pasta. Inglis et al. (2005) showed similar results to ours when they stated that time constraints caused low and mid-SES women to buy more fast food, but it did not refer to one nutritional status specifically. The problem with this situation is that fast food is less healthy, and involves other unhealthy behaviors, such as eating fast or doing other things (Inglis et al., 2005; Sawkill et al., 2013). This also produces a loss of family time together, and reduces homemade food (Jabs & Devine, 2006). All these facts can become risk factors for these normal weight participants, which may result in weight gain.

As we considered the Socioecological model (Gregson et al., 2001) as framework for this study, we wanted to see how the themes that we found were distribute along the different levels of this model. Doing this exercise, we noticed that the themes found can be distributed in all the levels of it (Figure 5.1 y 5.2). From the seven themes that were found in the whole group, "preferences", "perceptions about food" and "financial issues" were attributed to the individual level. "Preferences" was a theme that was dependent on the likes and dislikes of each participant, thus, there were variances among them. "Perceptions about food" were related to the degree of knowledge or the presence of beliefs or myths that each participant had. "Financial issues" was also determined to fit in the individual level because it was a theme that was related to participants' thoughts about their lack of money to buy what they wanted. This theme can also be

related to other model levels, such as the community level, due to the fact that the price of food determined the place where participants bought their food in their neighborhoods.

Figure 5.1. Adaptation of the Socioecological Model using the themes found as influences on Chilean women's eating behaviors



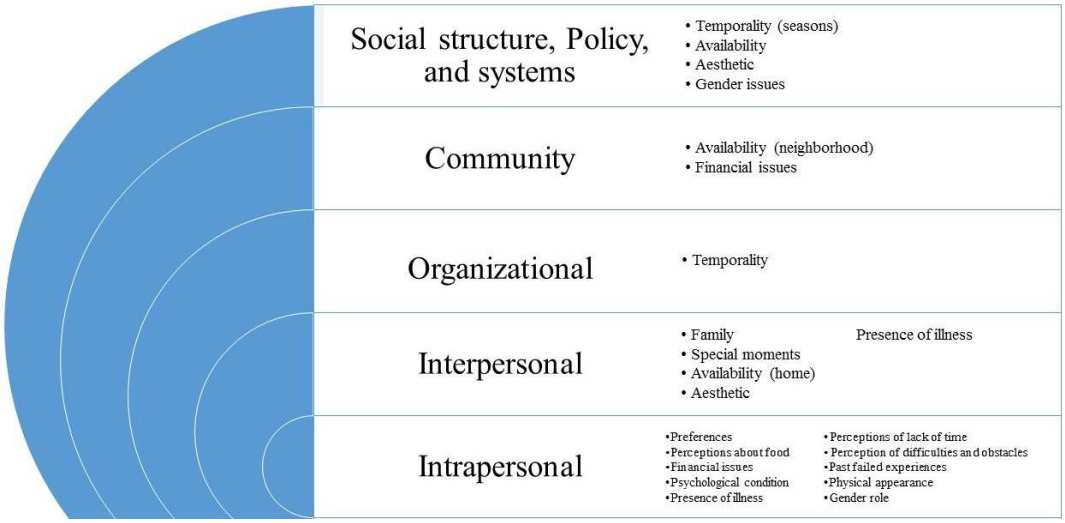
"Family" is the theme that accounts for the relationships that are present between family members and the women and was ascribed to the interpersonal level. Due to the fact that "special occasions" were also linked to other people, such as family members or friends, this theme was also assigned to this level. In addition, "the availability of food" at home was allocated to the interpersonal level, because it was dependent on what other family members brought home or what participants bought according to the needs of their families.

In relation to the organizational level, participants did not mention any organizations as having a direct effect on their eating behaviors. This is probably due to the fact that most of them did not work outside of the home or were not associated with a religious, educational or other kind of organization. Just one participant mentioned religion in her interview, but it was not a factor that influenced her eating behaviors. Nonetheless, it was possible to observe that

"temporality" influenced other family members, affecting participants' eating behaviors indirectly. This theme and its effect were allocated to the organizational level, for two main reasons: First, most organizations such as schools and companies in Chile have a Monday to Friday work week, which means that during the weekend participants could spend time with their families. In the same way, these organizations have established work schedules; therefore, participants knew at what time their family members would arrive home and they could wait for them with their lunch or dinner/tea time ready. "Temporality" was also positioned in the level of organization since the seasons also influenced participants' routines. This is particularly related to summer because it is a time when most children are on vacation and at home, changing the participants' routines. A similar situation is found when children have vacation from school during the winter. Therefore, "temporality" indirectly affects participants through their family members that are influenced by the rules of different organizations.

The "availability of food" was assigned to the community level due to the fact that participants mentioned that if they found a certain food in their neighborhood, it was more probable that they ate it. "Availability" was also attributed to the social structure, policy and systems levels because the availability of food in the community (and at home) also depends on the existence of policies that control the quantity, quality, and variety of food that is sold in local areas. "Temporality" is also linked to policies and the availability of food, specifically in relation to the seasons. As the seasons change during the year in Chile, the kind of food that is available for consumption also changes. Current policies as well as the food system in the country, ensure that there is enough food for the population during the entire year (Ministerio de Agricultura-Gobierno de Chile, 2016). In addition, the same food system allows for the existence of seasonal foods (Oficina de Estudios y Politicas Agraria, Universidad de Chile, & RIMISP, 2002).

Figure 5.2. Adaptation of the Socioecological Model using the themes found as influences on Chilean women's eating behaviors, *when analyzed by nutritional status group*



Note. Most of the new themes were found in obese participants. The perception of lack of time was found just in normal weight participants. Perception of difficulties and obstacles was found in overweight and obese participants.

When adding the new themes that were found when we analyzed the three nutritional status groups to the model, we realized that most of the new themes were at the individual level. The characteristics of each woman, such as mental and physical status, were assigned to the intrapersonal level. The "presence of an illness" was also placed in the interpersonal level, because participants mentioned that illness in their family members also affected their eating behaviors. Perceptions that participants had about their "lack of time" or "the barriers" they faced in order to eat healthier were also assigned to the intrapersonal level, despite the fact that participants indicated that these variables were also related to factors from other levels. For example, the perception that eating healthier is more expensive could be related to the political level, but since it was a personal perception, we decided to leave it in the intrapersonal level.

"Past failed experiences" was also placed in the first level of the model, due to the fact that every experience is unique and that each participant lived in a different way. "Physical appearance" was attributed to three levels. It was assigned to the intrapersonal level, because physical appearance was related to opinions that participants had about themselves. We also saw it as being a part of the interpersonal level, because some participants referred that the opinion of others (for example, their husbands), which influenced their feeling of discomfort with their bodies. Finally, physical appearance was also placed in the social structure, policy, and system level because ideas about beauty are set by cultural and social norms that of course influenced the participants at an individual level.

"Gender roles" was another theme that was placed in three levels. We assigned it to the intrapersonal level because participants believed that serving their husband and their children was part of their role in their family. This theme was also placed in the interpersonal level, because it deals with the relationship that participants had with their family members, but, since this was an idea that came from the participants' perspectives, we attributed it to the interpersonal level. In addition, we also assigned gender roles to the last level of the model, since it is a variable that is related to cultural and social norms. These norms influence how women behave in society, especially those who do not work outside of their home. As such, due to these norms, it is possible that our participants perceived that working for their family is something that is mandatory for them. This was particularly true for obese participants, who also had low self-esteem.

5.2 Strengths and Limitations

This research presents five main strengths. First, we used interviews with photo-elicitation for the data collection, which is a methodology that has not been used before in Chile, and can present several advantages when working with underserved or vulnerable population (Najib Balbale, Schwingel, Chodzko-Zajko, & Huhman, 2014; Sebastião, Gálvez, Bobitt, Adamson, & Schwingel, 2016). This technique allowed us to obtain rich information about eating behaviors and helped us overcome challenges that researchers face when working with a vulnerable population, such as differences in education and literacy. Photo-elicitation relies not on reading and verbal literacy, but on visual and technological literacy, which has the benefit of avoiding confusion that can be caused by differences in language proficiency.

A second strength is the sample size. Our study included thirty-one women from low SES. Most of the studies on eating behaviors that have used photo-elicitation do not include more than fifteen participants (See for example, the studies of Johnson, Sharkey, & Dean, 2011; Keller et al., 2007; Lachal et al., 2012). In addition, we reached data saturation in the 22th interview, but we continued conducting data collection. Doing this, we could confirm that no more new themes appeared in the interviews.

The third strength is that the primary analysis (thematic analysis) was conducted by five researchers, which reduces the bias that one analysis could have. The fourth strength is that in the analysis we studied three main behaviors. These behaviors were extracted from what participants discussed, therefore, the voices of the participants is what is shown in this study. The last strength is the analysis conducted. We conducted a qualitative analysis in a first instance, and then a mixed method analysis, to reach a better understanding about what was happening in each

nutritional status group. This was an innovative analysis because we were able to see how the variables that influenced women's eating behaviors behaved by looking closer at each group.

We also recognize some limitations of this study. The study included some participants who met the inclusion criteria, but, even so, did not want to continue with the study. We did not review the reasons or any specific characteristic that would explain why these women did not continue with the study. Additionally, for the photo-elicitation assignment, we told the participants to take pictures about whatever they wanted, but in relation to their food world. In this way, we trusted that participants would photograph their food world honestly. However, it is possible that there is a bias in the photos taken, since participants may have photographed what they deem is acceptable or unacceptable in regard to food. This idea was confirmed by seeing the pictures, in which we observed that most of the pictures did not include unhealthy food. Moreover, the participant criteria that we had for this study just included women with children and partners, which could be the reason why they mentioned family as an important influence in their lives. In addition, this research was conducted during the summer, which in the case of Chile, means that there were more fruits and vegetables available at the time that participants were taking photographs. This fact could have affected why participants mentioned seasons as an influence of their behaviors. Finally, the sample size was appropriate for qualitative analysis but not for quantitative comparison.

5.3 Conclusion and Future Implications

This current study explored the influences that affect the eating behaviors of a group of women from low SES background, living in urban areas of Santiago, Chile. Semi-structured interviews with a participatory technique (photo-elicitation) were used to obtain information from participants. In a final analysis, participants were separated by nutritional status to compare how the found influences played out among participants with normal weight, overweight, and obesity. To our knowledge, this is the first study that separates the analysis into three nutritional statuses and compares them, looking for similarities and differences between groups.

The "purchasing of food", the "cooking process", and the "intake of food" were the three pillars of eating behaviors that were identified in this study and used as the base of our model. Seven themes were identified as being influential on these three pillar of eating behaviors: "Family", "Temporality", "Preferences", "Financial issues", "Special occasions", "Perceptions about food", and "Availability in the neighborhood and at home". Participants reported the importance of their family in their food decisions. "Family" affected the food they purchased, how they cooked that food and finally how they ate the food. This theme also was found to influence the other themes in the model (Figure 4.2). Overweight and obese participants showed that their "food world" strongly depends on their families, whereas participants who were normal weight did not appear to rely as strongly on their families. Temporality had two components: what happened during the days of the week and what happened during the different seasons of the year (especially winter and summer). Temporality affected participants mainly during the weekend, because they tended to change their eating behaviors at this time. This was because they had a more unstructured routine on the weekend and because they were together with their families, a fact that was mostly commented on by overweight and obese participants. Participants

also mentioned that they changed their behaviors during the year, and more changes were observed in participants that were overweight and obese, especially in relation to their consumption of fruit and vegetables.

Preference was another important theme mentioned by all participants, and it mainly influenced the intake of food. Participants indicated that they ate or did not eat certain foods based on their likes and dislikes. This theme behaved similarly in the three nutritional status groups, but only participants with obesity showed a stronger relationship with food, when they mentioned that they *love* certain foods. Participants also mentioned that financial issues influenced the three behaviors. However, this theme presented different patterns depending on the nutritional status of the participants. Overweight and obese participants discussed financial issues more than normal weight participants and they had more to say about the issue. Most participants also mentioned that there are special occasions, such as special dates during the year, when they ate special foods. This theme was similar in all the nutritional status groups. Moreover, participants talked about how some perceptions related to the knowledge that they have, made them eat or not eat certain foods. This theme behaved differently between the groups, showing that normal weight and overweight participants had more nutritional knowledge, while obese participants talked more about how certain foods increased their weight or the fact that some foods were essential for them and their families. Finally, the availability of food affected the purchasing of food mostly because it was connected to what participants could find in their neighborhoods. In addition, it affected food intake because it was related to what participants could find at home. This theme had similar patterns in each of the three groups.

Other themes were found when the whole group was divided into the nutritional status groups. These new themes mainly appear in the obese group. In the obese group, most women

indicated that they had a mental condition, such as depression or anxiety that caused them to eat more. None of them had been diagnosed by a physician. All participants in this group also mentioned that they had a health condition or that one of their family members had a health condition, which caused them to change the intake of certain foods as well as affected the way in which they cooked certain foods. Overweight and obese participants also pointed out that there were several barriers that made it difficult to change the way that they ate. Issues related to how participants looked and how this concern caused participants to try to change the way the way that they ate was found mainly in the obese group of participants. The lack of success on previous intents of change eating behaviors, and issues related to their roles as a woman, mother, wife, and even as a caregiver were found only in the obese group. Finally, perceptions about the lack of time was indicated primarily by normal weight participants.

This research provides information to people who make health decisions, especially in relation to women's diets, in order to promote healthy eating in healthy people as well as obese people. Women have an important role in the society, therefore it is important to empower them in regard to healthy eating, which in turn benefits the society as a whole. With the analysis that we conducted, we confirmed that eating is a multilevel-influence behavior and as such, interventions on an individual level, interpersonal level, and policy level are necessary to promote healthy eating and to help obese and overweight women reduce their weight.

The challenge now is how we translate our findings to proper interventions. Our first suggestion is to continue working with intrapersonal influences that allow the strengthening of self-efficacy, self-control, and self-esteem in women, especially those who are obese. Until now, most interventions in Chile to prevent and treat obesity focused more on individual strategies, but that does not necessarily have the goal of improving these elements of the self. These

individual interventions are possibly more oriented towards directly changing unhealthy behaviors, which is difficult if the person is not psychologically prepared for those changes. To improve the way in which health care providers undertake individual interventions as well as the kind of nutritional education that they are providing, they must provide key elements to help people to change. This implies training that goes beyond the caloric and nutrient intake. Second, it is necessary to conduct more research where family is seen as the variable to modify. We think that including the family in interventions to promote healthy eating in women could have more benefits for these women, but also for the family members. In our study, all participants were mothers living with a partner; therefore, the influence of family was high for them. Another project could be directed at other kinds of family structures, to see if these other structures could produce a similar effect on women's diet. Third, more research is necessary to establish the impact of the season on individuals' diet, as well as, the effect that the weekend has on them. If this is done, the findings could have an effect on the way that we promote healthy diets at the individual level, as well as at the policy level, which is related to the way in which we recommend healthy food to populations (for example, The Dietary Guidelines). This research showed implications that policies can have on eating behaviors. Therefore, more research about how changes in policies can affect women and families' diets is needed, for example, in price or agriculture regulations.

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APPENDIX A. INTERVIEW GUIDE

General question

What is your opinion about taking pictures? Was it easy/difficult? Tell me more about it

INDIVIDUAL FACTORS

What is your favorite food? Why?

Are there food you most like/dislike? Why?

What food do you consider important for you? Tell me more about them

Are there foods that make you feel happy? Tell me more about them…Are there foods that make you feel guilty? Tell me more about them…

What food do you consider good/bad? Tell me more about them

In general, what do you think about your eating habits?

What are the good/bad things that are in your diet? Tell me more about them

What do you think are the factors that influence your food selection?

Have you ever received training about food (i.e. cooking classes, nutrition classes)?

Do you know how to cook? What is your opinion of the way that you cook (for example… healthy, tasty, convenient etc.)? What is your family's opinion about your cooking?

In your opinion, what is the relationship between the diet a person has and his or her health?"

When I say "healthy food" what comes to mind?

What do you think about "healthy food"?

Are there some aspect from your health that influence the way that you eat?

What are the things that help you eat healthy? What are the things that do not allow you to eat healthy?

Have you ever intended to change your diet? Why? Were you able to change some aspects of your diet? What aspects could you change and why do you think that you could change them?

Do you know of any recommendations about how you should eat? Tell me more about them

How much do you control your diet? Tell me more about it

Have you intent to change your diet? Why?

DO you think that your emotions influences the way that you eat? Why and how?

Would this change be good or bad for you? Why?

How capable do you think you are of changing your diet? Why?

How concerned are you about what you eat and drink? Why?

How often do you shop for your food?

How do you decide what to buy?

Are there some past experiences (during your childhood for example) that influence the way that you eat? Tell me more about it

Are there some current experiences that influence the way that you eat? Tell me more about it

Do you think that can buy and eat what you want? Tell me more about it.

INTERPERSONAL FACTORS

What is your role in your family? Tell me more about it…

What is your family's favorite meal? Tell me more about it…

What is the relationship between your family and your food?

Who is the most important person in your life? Does he/she influence your eating behavior?

How does your family influence what you eat?

Is it important to you that your family eats well? Why?…

Are there members of your family who have recommended that you eat in another way? Have you paid attention to these recommendations? Why?

Are there people outside of your family who influence (positively or negatively) your eating behavior? Who are they?

ORGANIZATIONAL AND COMMUNITY FACTORS

What do you think about your community and its access to food in general?

What do you think about your community and its access to “healthy food”?

How would you describe the food and drink available to purchase from your place of work?

Where do you buy your food? How do you get there? How easy/hard is it to get the foods that you like to eat?

Are there people from your community that could influence the way that you eat? Who? How?

Are there organizations in your community such as group of women, group of parents, etc that influence the way that you eat? Which? How?

SOCIAL STRUCTURE, POLICY AND SYSTEM FACTORS

Have you ever received a recommendation about your diet from a health care professional? If the answer is yes, what type of recommendation have you received?

Have you heard or seen any recommendations about diet from the government or ministry of health? If the answer is yes, what type of recommendation have you heard or seen?

Have you participated in some program from the government or other governmental institutions? Tell me more about them

How the price of food affect the food what you buy or eat? Tell me more about it

APPENDIX B. DEMOGRAPHIC CHARACTERISTIC AND HEALTH STATUS FORM.

Participant's number

Participant's characteristic

Demographic

1. Date of birth

2. Marital status Single ☐ Cohabitant ☐ Married ☐ Divorced ☐ Separated ☐ Widow ☐

3. Children Yes ☐ Number of children

No ☐ Ages of children

4. Educational attainment Elementary ☐ Vocational ☐ Master/PhD ☐ High School ☐ Higher education ☐ None ☐

5. **Level of employment** Employed ☐ Unemployed ☐ Current or past occupation

6. Type of housing House ☐ Apartment ☐ Other

7. Homeownership Own ☐ Rent ☐ Other

8. Number of people that live at home

9. Head of household Participant ☐ Spouse/Partner ☐ Parents ☐ Parents in law ☐ Son/daughter ☐ Other ☐

10. People that contribute economically at home Participant ☐ Spouse/Partner ☐ Parents ☐ Parents in law ☐ Son/daughter ☐ Other ☐

If participant is not the head of household, answer the following:

11. Educational attainment Elementary ☐ Vocational ☐ Master/PhD ☐ High School ☐ High education ☐

12. Level of employment Employed ☐ Current or past occupation ☐ Unemployed ☐

13. Total income at home ☐

Health

14. Health insurance Public ☐ Private ☐

15. Presence of Chronic Disease Yes ☐ No ☐ Diabetes ☐ Hypercholesterolemia ☐ Hypertension ☐ Hypertriglyceridemia ☐ Other ☐

Physical activity

16. During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?

Yes ☐

No ☐

17. What type of physical activity or exercise did you spend the most time doing during the past month?

☐

18. How many times per week or per month did you take part in this activity during the past month?

Times per week

Times per month

19. And when you took part in this activity, for how many minutes or hours did you usually keep at it?

20. During the past month, how many times per week or per month did you do physical activities or exercises to STRENGTHEN your muscles? (Do NOT count aerobic activities like walking, running, or bicycling. Count activities using your own body weight like yoga, sit-ups or push-ups and those using weight machines, free weights, or elastic bands)

Times per week

Times per month

Anthropometry

	measure 1 (Oct- Feb)	
Weight		
Height		

APPENDIX C. FOOD FREQUENCY QUESTIONAIRE

Food	Monthly frequency	Kind of this food more consumed	Times per day consumed	Amount consumed per time (pictures from atlas)
Bread				
Breakfast cereal				
Sweet cookies				
Salty cookies				
Rice				
Pastas				
Potatoes				
Corn				
Peas				
Lima beans				
Oat				
Cooked vegetables				
Raw vegetables				

Appendix C (Cont.)

Canned vegetables				
Citric Fruits (oranges, tangerines)				
Other fruits				
Fruit juice				
Canned fruit				
Milk				
Yogurt				
Cheese				
Home Dairy Desserts				
Packaged dairy desserts				

Appendix C (Cont.)

White meat (turkey, chicken)				
Fish				
Red meat (beef, pork)				
Meats (ham, salami, Viennese sausages)				
Seafood				
Legumes (beans, lentils, and others)				
Eggs				
Oil				
Butter				
Margarine				
Lard				
Nuts				
Cream				
Fried food				
Avocado				
Mayonnaise				
Sugar				
Jam				
Honey				

Appendix C (Cont.)

Chocolate				
Cake				
Ice cream				
Candies				
Alcohol				
Soda				
Juice				
Otros:				